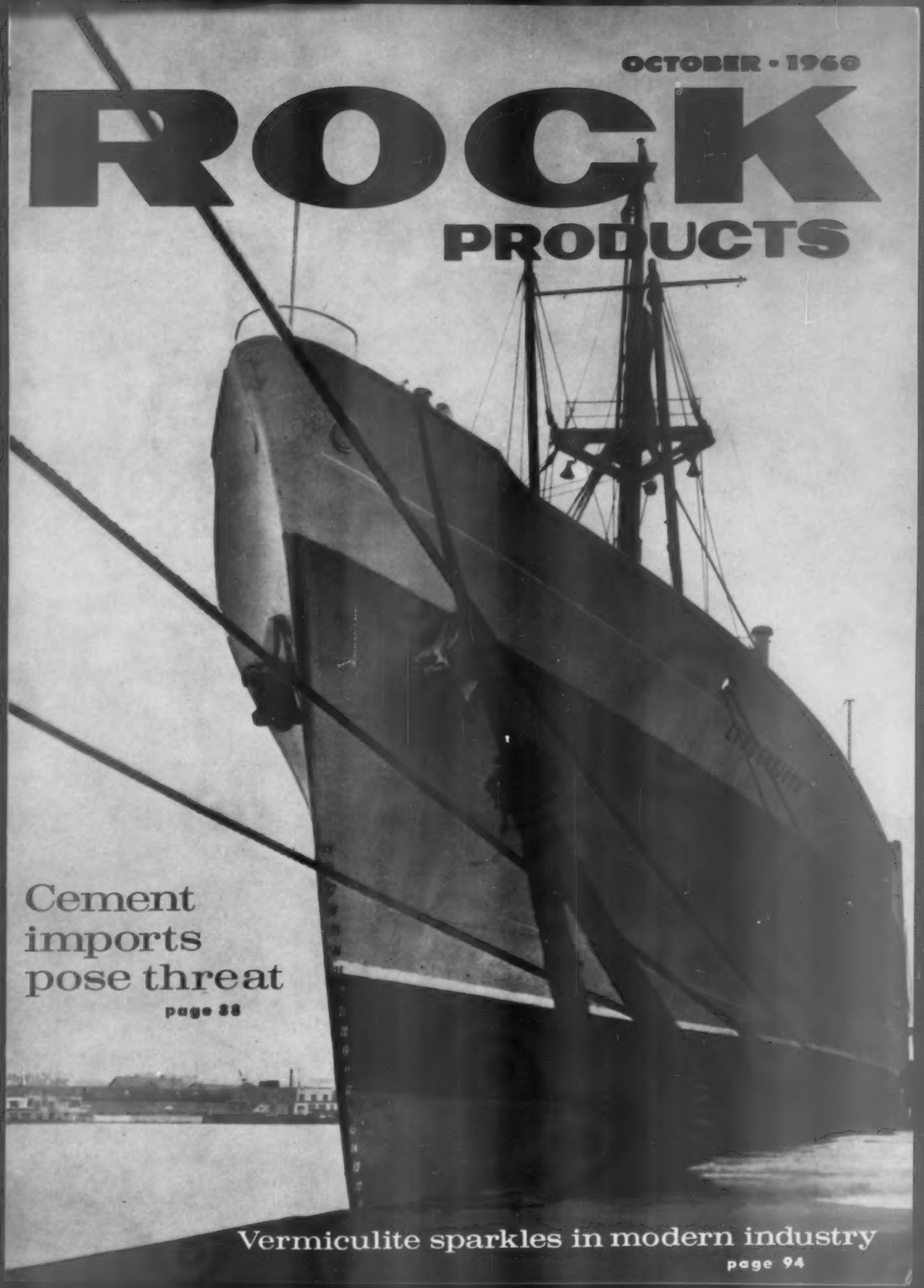
OCTOBER · 1960

ROCK PRODUCTS



Cement imports pose threat

page 88

Vermiculite sparkles in modern industry

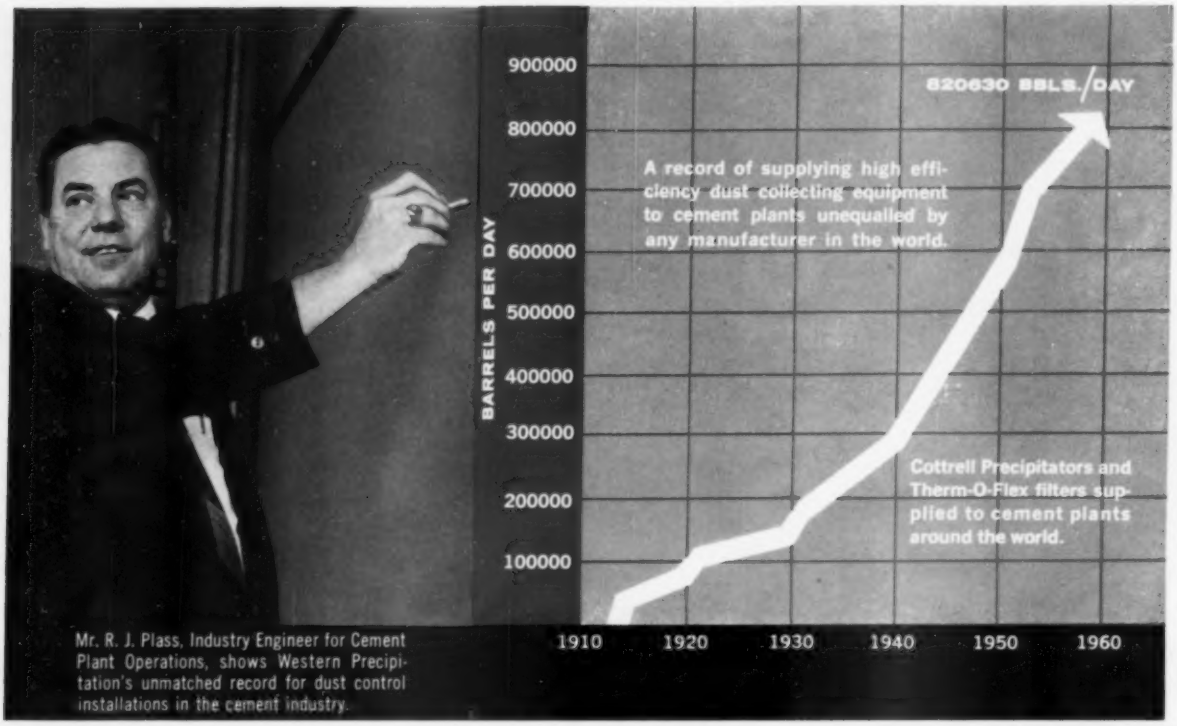
page 94

A WORLD-WIDE "EXPERIENCE RECORD"

UNEQUALLED IN THE ENTIRE CEMENT INDUSTRY!

Since its first cement plant installation almost a half-century ago, Western Precipitation has installed dust collection equipment on cement plants with a combined operating capacity of over 820,000 barrels per DAY... a record for wide-range experience, for customer satisfaction and overall "know-how" of kiln dust control that is unequalled in the entire industry!

Not only is this a testimonial to the reliability of Western Precipitation equipment (for the major percentage of these installations were repeat orders from satisfied customers) but it is also an indication of the way Western Precipitation equipment has kept pace with new processes and new advancements as they have been adopted by the cement industry.



Mr. R. J. Plass, Industry Engineer for Cement Plant Operations, shows Western Precipitation's unmatched record for dust control installations in the cement industry.

Regardless of your type of operations, Western Precipitation engineers can provide an unbiased evaluation on the type of equipment best suited to your particular requirements—an evaluation backed by the industry's top organization in cement plant dust control!

"Cottrell" Electrostatic Precipitators—the equipment pioneered by Western Precipitation for high efficiency, long life electrostatic separation of dust particles from gas streams.

"Multiclone" Centrifugal Collectors—the multiple small-tube mechanical collectors pioneered by Western Precipitation for high-efficiency, low maintenance centrifugal separation of dust particles from gas streams.

"Therm-O-Flex" High Temperature Filters—the woven glass filter systems that handle gas inlet temperatures as high as 600°F. and feature new type silicone-treated filters that can be cleaned automatically without destructive shaking or high-frequency vibration.

▶Write for descriptive literature on Western Precipitation's equipment for kiln dust collection!

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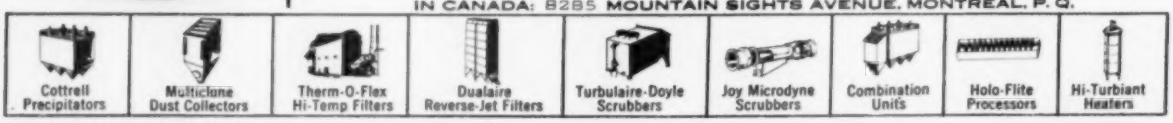

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Curtiss-Wright CW-226 with Hi-Torque brakes carries heavy loads, averaging 90,000 pounds of earth.

Contractor gets trouble-free performance with Hi-Torque brakes on rough, hilly terrain

Completely dependable brake performance, with high stopping power always available, has been reported by Talbott Construction Company, Winchester, Ky. Talbott operates several Curtiss-Wright earthmovers with B.F.Goodrich Hi-Torque brakes.

On one project, the machines were in operation on rough, hilly terrain over a six months period, ten hours a day, six days a week. No adjustments, replacements, or maintenance of any kind was required. Dust and water are effectively sealed out, so the environment presented no ill effects. Automatic adjusters maintain proper clearance, adjust for lining wear.

B.F.Goodrich Hi-Torque brakes cut stopping distance approximately in half, compared to conventional two-shoe brakes. These brakes are now available on heavy dump trucks, tractor-scrapers, coal haulers, mine trucks, and other heavy off-highway vehicles, from several manufacturers. For information ask your equipment maker, or write *B.F.Goodrich Aviation Products, a division of The B.F.Goodrich Company, Department RP-10, Troy, Ohio.*

Hi-Torque brakes permit safe operation on faster cycles.

B.F.Goodrich Hi-Torque brakes

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ROCK PRODUCTS

a Maclean-Hunter publication, Vol. 63, No. 10

October 1960

In this issue

Departments

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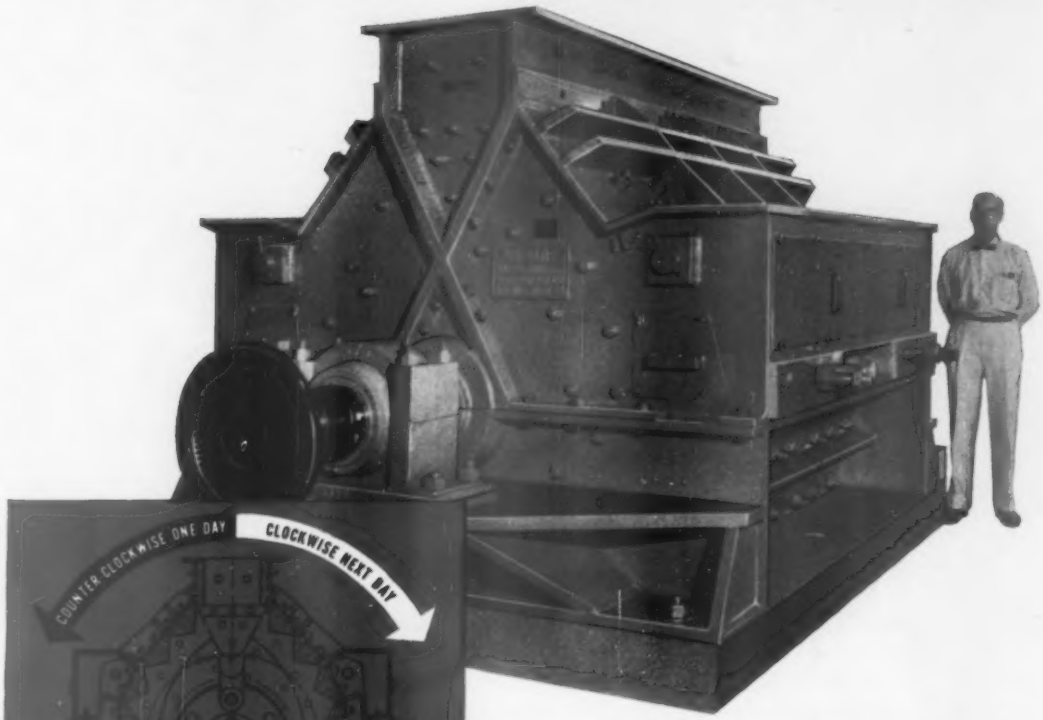
More efficient CRUSHING AT LOWEST COST for labor, power and upkeep with WILLIAMS REVERSIBLE IMPACTOR



REVERSIBLE ROTATION prolongs parts life without manual adjustment. A simple reversing switch on motor does it.

INTERIOR VIEW of small Impactor shows typical rugged hammers, impact blocks and liners made of manganese steel and other alloys. Rotor removable without disturbing feed or other mechanisms.

For secondary crushing, the economy and high production of a Williams Reversible Impactor is unequalled, whether raw material is hard and abrasive or soft and friable. Precision control of specified top-size is easy, usually in a closed circuit system, from a coarse 2" with minimum fines, down to 35 mesh or finer.

The Impactor has no grates. Material fed into the mill is reduced to proper size while rebounding between the whirling hammers and impact blocks, until discharged from bottom opening. Grinding or rubbing action is eliminated—power, replacement parts and downtime are reduced to a minimum. No fine adjustments need be maintained.

Reversible rotation is a prime feature of the Williams. So is *Wide Open Accessibility* to interior. So are the *Interchangeable Impact Blocks* to balance wear. So are the many other exclusives that hold cost-per-ton to the very lowest. There is a size and model for your exact needs. *Write for catalog.*

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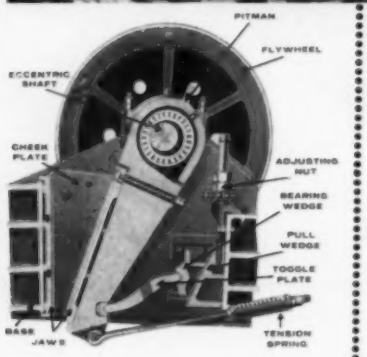

DIAMOND

A Key unit for full time peak performance

DIAMOND JAW CRUSHER

Whatever the set-up and no matter how rugged the job, Diamond's "long-jaw" handles hardest rock with ease . . . day in, day out. A positive and uniform crushing cycle combined with quick jaw openings permits fast feed and discharge, insures full time peak performance . . . superior crushing records.

Diamond's Jaw Crushers are built to take it! The Pitman operates on a heat treated, forged alloy steel shaft and supports the moving jaws. Extra long and made of manganese steel, the jaws are easily changeable and reversible for longer service. A *double row* of adjustable Timken bearings for both main and Pitman bearing assemblies carries the heaviest radial and thrust loads—a Diamond exclusive.

Records in hundreds of pits, quarries, construction jobs, prove that Diamond Jaw Crusher is a top performer. Its ability to take rough punishment and to produce greater tonnage per square foot of jaw area make it a profitable investment. If it's your responsibility to produce continuous tonnages and see that aggregate production costs are kept down, you'll want complete details on Diamond Jaw Crushers. Write for Catalog D-116 . . . no obligation.

Diamond Jaw Crushers in 11 Sizes

Capacities 1½ to 500 tons per hour

6x12	10x36	24x36
10x16	15x24	30x42
10x20	15x36	36x48
10x24	20x36	

Diamond makes everything for the aggregate producer:

Jaw Crushers • Roll Crushers • Conveyors • Screens and Washers • Feeders and Bins • Portable and Stationary Crushing Plants for Rock and Gravel.

DIAMOND IRON WORKS

DIVISION

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Another Dixie Stone Producer buys NORTHWEST!

MORE and more quarries and pits below the Mason-Dixon line are finding out what Northwest Shovel equipment means in production. Here is another of the many producers in Georgia, Alabama and Florida who have found that a Northwest Shovel means higher output at lower cost.

This big, new 80-D is in the pit of the Quality Lime Products Company at Ocala, Florida.

Northwests are built for *rock work.* Machinery Bases are rugged, heat treated alloy steel castings with cast machinery side frames. Realize what this means. It assures a lifetime of permanence of shaft alignment. It eliminates weaving that is the direct cause of wear. There is nothing else like it.

You can go through the whole machine Booms! — Sturdier for workhorse digging and lifting. Uniform Pressure Swing Clutches!—cooler running, trouble-free. The Helical Gear Drive! —running in oil, mounted on antifriction bearings free from the adjustments and stretching that comes with chain drives. The Feather-Touch Clutch Control!—with the *feel of the load.* The Cushion Clutch, a wide range of Boom Hoist Equipment to choose from, Easy Convertibility —These and many more advantages give you a piece of equipment with ability that you can't find anywhere else for handling the workhorse jobs and making money.

If you are planning on new equipment there are many other Northwest advantages you should know about. Let a Northwest man fill in the details.

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NORTHWEST *Always Ready to* **GO**

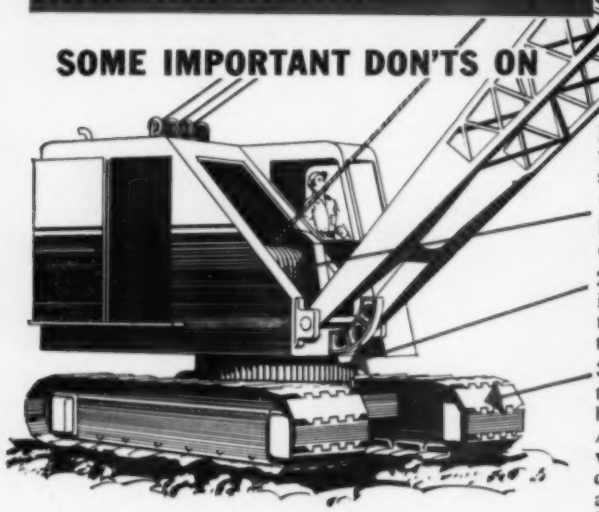
NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 60-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton to 35-Ton Capacity

LUBE LOGIC

Three time and money savers

SOME IMPORTANT DON'TS ON POWER SHOVEL LUBRICATION

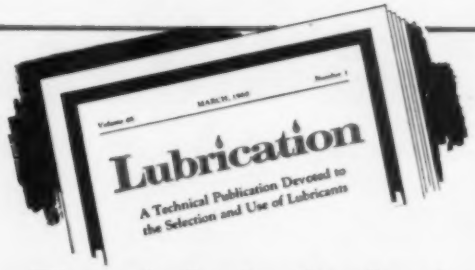


It's an old Texaco maxim that over-lubrication is sometimes worse than none at all, and there are three vital spots on power shovels where this is particularly true:

1) WIRE ROPE that winds onto drums fitted with clutches should be lubricated very sparingly; otherwise, the lubricant may get onto the clutch faces and cause slipping.

2) TURNTABLE ROLLER PATH should never be lubricated, unless it's the double-flange type with hook rollers. Lubricant will cause the rollers to slide and wear flat. Lubricate the bearings of turntable rollers sparingly to avoid drip on the turntable path.

3) TREADS, for instance, should never be lubricated at all. (We're talking about the tread only now; the track rollers or idling assemblies need very different treatment, which we discussed in the April/May 1960 Lube Logic). The pins that connect the individual treads are designed to operate without lubrication. Any oil or grease on these pins will pick up abrasive dirt which would act as a lapping compound on the pins and drastically shorten service life.



The whole truth about mobile lube rigs

What does it take to make a mobile lube rig? What do you put on it? How do you use it? The questions have been coming in so fast lately that Texaco has devoted a whole issue of its magazine, *Lubrication,* to answering them: the March 1960 issue, titled "Mobile Lubrication Equipment."

Lubrication is a major factor in cost control, and lube rigs can be a major factor in thorough maintenance, so send for your free copy of the March *Lubrication.* Supply of these valuable booklets is limited, so if you want one, send in your request *now* to Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Department EM-20.

End-of-shift is best fueling time

They say there's a time and a place for everything, and for refueling your equipment the best time is the end of each day's work. And here are two reasons why: End-of-shift fueling minimizes the possibility of fuel-tank rusting, because there's no room for condensate to form in a tank that's full of fuel. And tank-bottom sediment, stirred up by incoming fuel, has a chance to settle down overnight, so it won't be drawn into the fuel line.

TEXACO LUBRICATION ENGINEERS

If LUBE LOGIC doesn't solve your problems, call your local Texaco man. Anytime, all the time, he's your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control."
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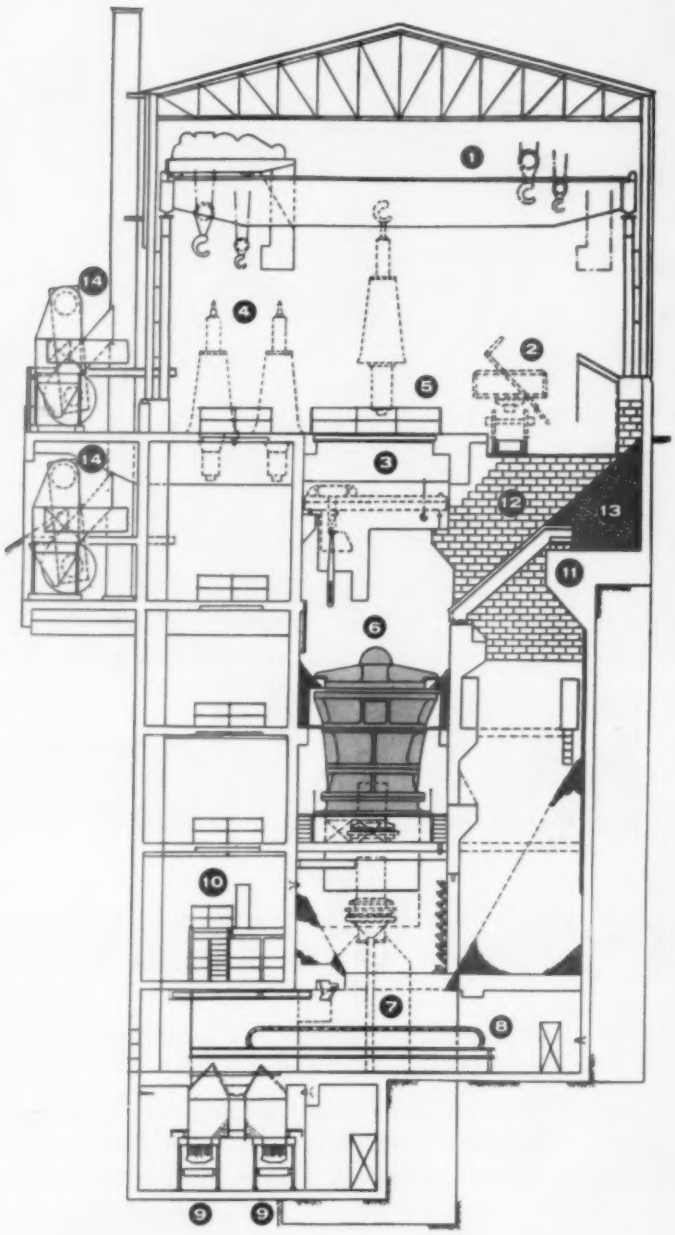

TRAYLOR

world's largest manufacturer of 60" gyratory crushers designed and built this giant for installation in Peru.

The Southern Peru Copper Corporation called on Traylor-made ECONOMY, EFFICIENCY, AND CAPACITY to handle the tremendous crushing workload at its new plant in Toquepala, Peru.

Drawing shows Traylor 60" gyratory crusher operation:

1. 100-ton crane with 25-ton auxiliary hook and operator's cab
2. 43-cu. yd. side-dump mine car
3. 20-ton crane with rock hook
4. Mantle storage
5. 18 x 22-ft. removable hatch
6. 60-in. Traylor gyratory primary crusher
7. Hydraulic hoist, 14-ft. lift, 25-ton capacity
8. Two 72-in. pan feeders
9. Two 54-in. chain-belt conveyors
10. Electrical control panel
11. 8-in. grizzly
12. 2-in. plate liners
13. Dead-bed areas
14. Air filter dust removal unit

Other Traylor Crushers made for primary, secondary or fine reductions. Write today outlining your crushing requirements and let Traylor's engineers make recommendations . . . or ask for Bulletin No. 1126.

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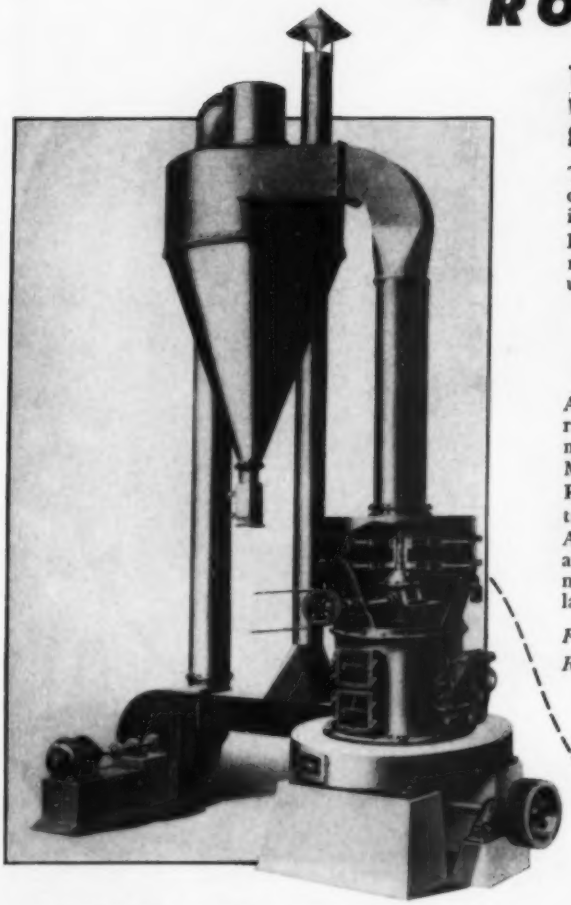
roll up new production... and profit...records

with

Raymond ROLLER MILLS



RAYMOND MULTI-PURPOSE ROLLER MILL WITH DOUBLE WHIZZER AIR SEPARATOR

Top performing RAYMOND Multi-Purpose ROLLER MILLS with WHIZZER AIR SEPARATION lead the field in fine grinding in the CHEMICAL and PROCESS INDUSTRIES.

This Mill combines the Raymond High Side Roller Mill and the double Whizzer Separator to afford great versatility and economy in the handling of many fine grinding problems.

Its wide scope of application covers the preparation of powdered materials . . . from simple fillers to fancy chemicals. Typical products pulverized include . . .

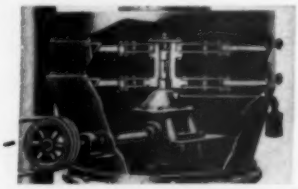
PIGMENTS • FULLERS EARTH • INSECTICIDES • IRON OXIDES • TALC • BARYTES • KAOLIN AND CLAYS • SULPHUR • CARBON MIXTURES • STARCH • LIMESTONE • BAUXITE • CALCIUM SILICATE •MINERAL FILLERS • PHOSPHATE ROCK • GYPSUM.

A single, easy adjustment of the Whizzer controls the fineness range from 20-mesh grades to products essentially all minus 325-mesh.

Mill capacities reach 40 tons per hour and more with a Super Roller Mill. Flash Drying Accessories may be installed when moisture removal is required.

All aspects of Fine Grinding are combined in a clean, dust-free, automatic system that is economical in operation and maintenance. Installations are flexible and readily adaptable to any plant layout.

For detailed information send for the Raymond Roller Mill Catalog Number 79R



Mills are available with Single or Double Whizzer Separators. Whizzers have set of radial blades attached to a disk that revolves on a vertical shaft in separating chamber. Variable speed drive insures finger-tip control of fineness.

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Coates Carbex Grinding Balls are made of fine-grained, high-carbon steel. Produced by skilled workers according to proved specifications guarded by continuing quality controls, they have earned an international reputation for quality and performance. Call for Coates Carbex Grinding Balls . . . built with care for longer wear.

Write today for prices . . . All sizes—½" to 5" carried in stock for immediate shipment.

COATES STEEL PRODUCTS CO. CARBEX TRIPLE-FORGED BALLS

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STEEL PRODUCTS COMPANY

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WHAT'S HAPPENING

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

The construction industry rebounded after a lagging start in the first months of 1960, and by June reached a point not too far—7 percent—below the high levels of 1959. In its midyear construction review, F. W. Dodge Corp. recorded total contracts for the 6-month period as $17.6 billion. Housing showed the greatest weakness, off 14 percent, but the heavy engineering category was only slightly behind 1959 and nonresidential building was running ahead. Housing starts in July reflected the decline in construction contracts. As reported by the Census Bureau, they dropped to a seasonally adjusted annual rate of 1,173,000 units, nearly 10 percent below June 1960 and 26 percent below July 1959.

Gilsonite is mined hydraulically by oil well drilling equipment by American Gilsonite Co. near Bonanza, Utah. This unusual method is made possible by the location of Gilsonite veins at or near the surface. Mining Congress Journal described the process in which men need not work along the underground faces: Vertical holes are drilled through the center of the ore vein to an intersecting bottom drift. Hydraulic high-pressure nozzles then take the place of drill bits and are lowered to the bottom drift. Water tears the ore free and it falls into the drift below. Then, a stream of low-pressure water takes the ore as slurry to other handling facilities which eventually raise it to the surface. Soon a TV camera will be installed at the level of the high-pressure cutting nozzle, to help the operator on the ground guide it most effectively.

Where to land on the moon and what kind of vehicle to drive on its surface are two questions which a recent publication will help to answer. It is by the Department of the Interior's Geological Survey and is called "Engineer Special Study of the Surface of the Moon." This is the first photogeologic study known to have been made of the moon. Three diagrams show the visible face of the moon and the text describes the various regions. Interpretation is made of the probable composition and texture of the surface material and its bearing strength.

Water is unnecessary with its new concrete binder, says Pro-Chimco Co. It has patented a special binding agent which, when mixed with sand, forms concrete "equal in quality or superior to that obtained by the usual means." Uses for the concrete? In block, sidewalks, foundations and flooring.

A rubber-asphalt road is being tested in England's highway network. The wearing surface is red rubberized asphalt mixture dressed with ½-in. aggregate coated with asphalt. Engineers claim it will offer longer wear and require less maintenance.

An alternative to portland cement as a grouting material has been introduced by American Cyanamid Co.—its new chemical grout, AM-9. When a catalyst is added to the grout in aqueous solution, it becomes a stiff, continuous gel in a controlled period of time. While still in liquid state, it is injected into soil or rock formations. It prevents passage of water through the mass, binds together the particles of soil, sand or loose rock and provides a moderate increase in shear strength. It may also be mixed with cement, bentonite, sawdust, dyes, salts and thickening agents to modify the properties of the solutions and resulting gels.

A target for chemical research workers to shoot at has been described in Industrial and Engineering Chemistry. The industrial designer's dream is a single material from which all the nation's mass-produced hard goods could be made. It would have the mar resistance of porcelain, chemical stability of gold, weather and wear resistance, minimum heat conduction and low cost. Also, it would be as easily shaped as clay, have controllable opacity like glass, have resilience or lack of it like rubber and be self-fastening as with a heat-seal, but without heat. Robert Hose of the Henry Dreyfuss organization thought up those challenging specifications.

Zinc saturation is a Russian method of combating corrosion in steel pipe. According to Coal Age, the Ukrainian Scientific Research Pipe Institute claims a thermal diffusion method that mutliplies the life of steel pipe 7 to 10 times. Here's how it's done: Researchers pack a section of pipe in a mixture of zinc powder and fire clay, put it into a special furnace and heat it to 838 deg. F.

The moon traveler's water supply is occupying the attention of geologists. If pitchstone, a volcanic rock, is there, water may be extracted by solar energy. Proponent of the idea is a research geologist from Aero-Space Labs. The process requires a Fresnel lens, an enclosed container, a cold trap and the pitchstone. Also, the geologist suggests that the water itself can be decomposed by solar energy to hydrogen and oxygen, thereby supplying rocket fuel for the return trip.

Rock is wired for sound in the Caverns of Luray, Va. Stalactites which serve as organ pipes cover a 3-acre area, but expansion to 64 acres is planned. These unusual organ pipes were set up by bolting small threaded rods of Allegheny Ludlum's alloy steel into the stalactites. Tone is generated and passed to an amplifier when an electronically controlled, rubber-tipped hammer strikes a stalactite; the alloy bolt vibrates with the rock, close to tiny, wire-wrapped magnets.

Colloidal silica, applied to surfaces, will keep them clean. Candidates for the treatment, says Du Pont, are any surfaces that have imperfections to which dirt can cling. Applied in very thin coating (by spray, brush, cloth or mop), the silica fills the pores and keeps out dirt. Industrial and Engineering Chemistry showed a picture of an oil storage tank that was painted pastel blue, then treated with the soil retardant. After 12 months, relatively little dirt had accumulated. The film does not affect weathering of paint, nor interfere with repainting.

NOTES FROM THE PUBLISHER

October, 1960

Dear Reader:

This year's early prediction that total new construction in 1960 would climb to $56 billion appears to be substantially correct. Supplying materials essential for construction and industrial production, the rock products industry as a whole should exceed $3 billion in sales to hit an all-time record. An estimated $300 million will be used for capital expenditures.

Plant materials, machinery and equipment will be needed to meet present demands. There has probably been more technological improvement in the cement industry during the 1950 decade than all previous improvement put together. Bigger equipment, industrial television, nuclear bed-depth controllers, complete instrumentation–these and many other developments have been applied to greatly improve plant efficiency, product quality and uniformity.

The vital, ever-expanding rock products industry, despite its great strides in mechanization, still has virgin territory that offers many opportunities in technological development. Generally, these opportunities are in the realm of drilling, blasting, hauling, processing and power. Where the next spectacular development may occur is not certain, but you may be sure that most of the equipment manufacturers are busily engaged in their research laboratories turning theories into new products.

ROCK PRODUCTS, alert to the need of its readers, has an expanded role now and in the future. It must today provide the leadership and counsel required for a broadened sphere of operations that will inevitably come tomorrow.

The informative editorial and advertising messages in ROCK PRODUCTS can be helpful in steering a wise business course and in developing better management skills.

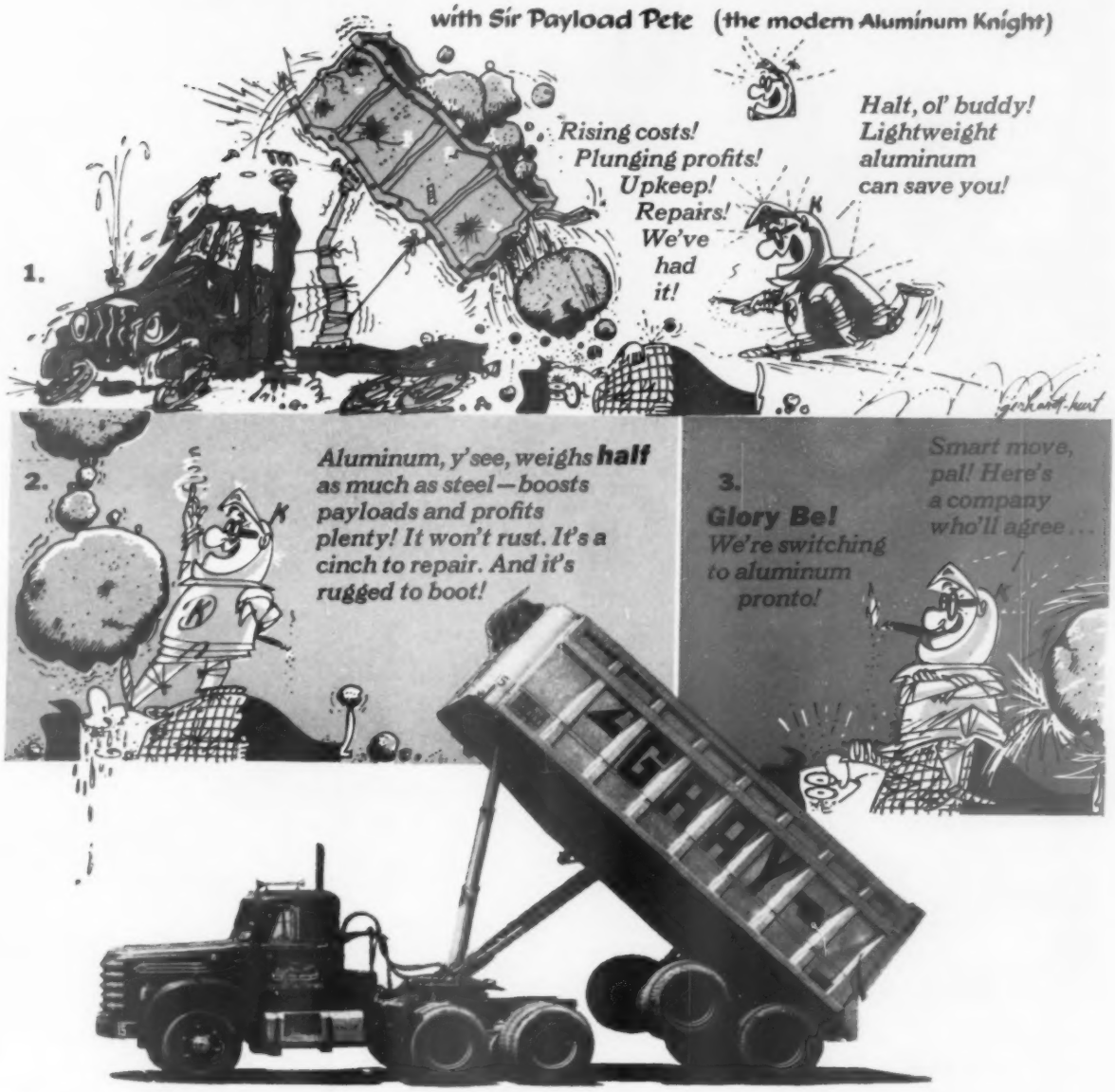
Sincerely,

Philip D. Allen

Philip D. Allen
Publisher

THE DUMPER'S DILEMMA

with Sir Payload Pete (the modern Aluminum Knight)



HAULS $25 EXTRA PROFITS PER DAY. Newest additions to the bulk hauling fleet of Jack Gray, Inc., Hammond, Indiana, are fifteen lightweight aluminum Heil-Tec frameless dump trailers with Diamond T tandem axle diesel tractors. President Jack Gray, Jr., reports, "These are the finest tractor and trailer dumps we have in our fleet. They are ideal for versatility of product haul. And the weight they save brings us $25 additional revenue every day." Reason: each unit weighs only 23,000 lbs., permitting a legal payload of 48,500 lbs. This is a hefty 8,000-lb. payload increase over comparable tractor-trailer combinations—three quarters of which is made possible by lightweight aluminum.

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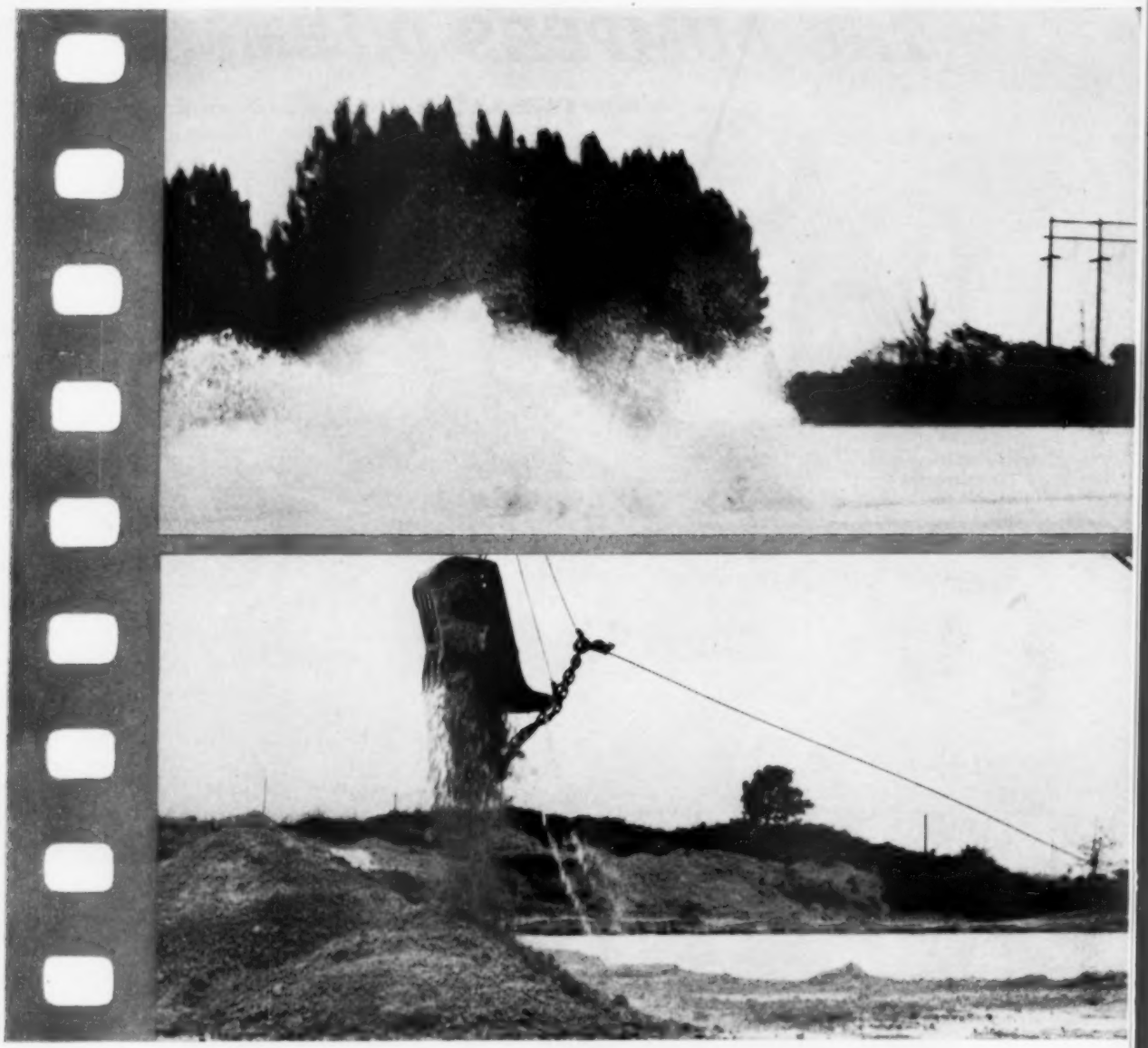

Link-Belt Speeder King-Size K Models

first in...first out...

HERE'S WHY... Speed-o-Matic *true* power-hydraulic controls increase cycles per shift up to 25% over manually controlled machines. Your operator stays fresh, alert, pushes production because he retains midmorning pace right to the end of his 8-hour shift.

In this 3-yd. rig, oil under pressure does the work... ends the hazards of jerk, jump or lag common to manual, air, and booster systems. Exclusive centerpin trunnion and oscillating roller design evenly distributes all loadings, eliminates prying action, minimizes stress and wear assuring long, trouble-free service.

There's Link-Belt Speeder precision, extra size in every component. More live weight — more strength, stamina, too, in the all-welded, stress-relieved upper and lower frames. Powerful springs individually set the traction brakes for positive steer . . . also act as automatic digging locks. No danger of run-away.

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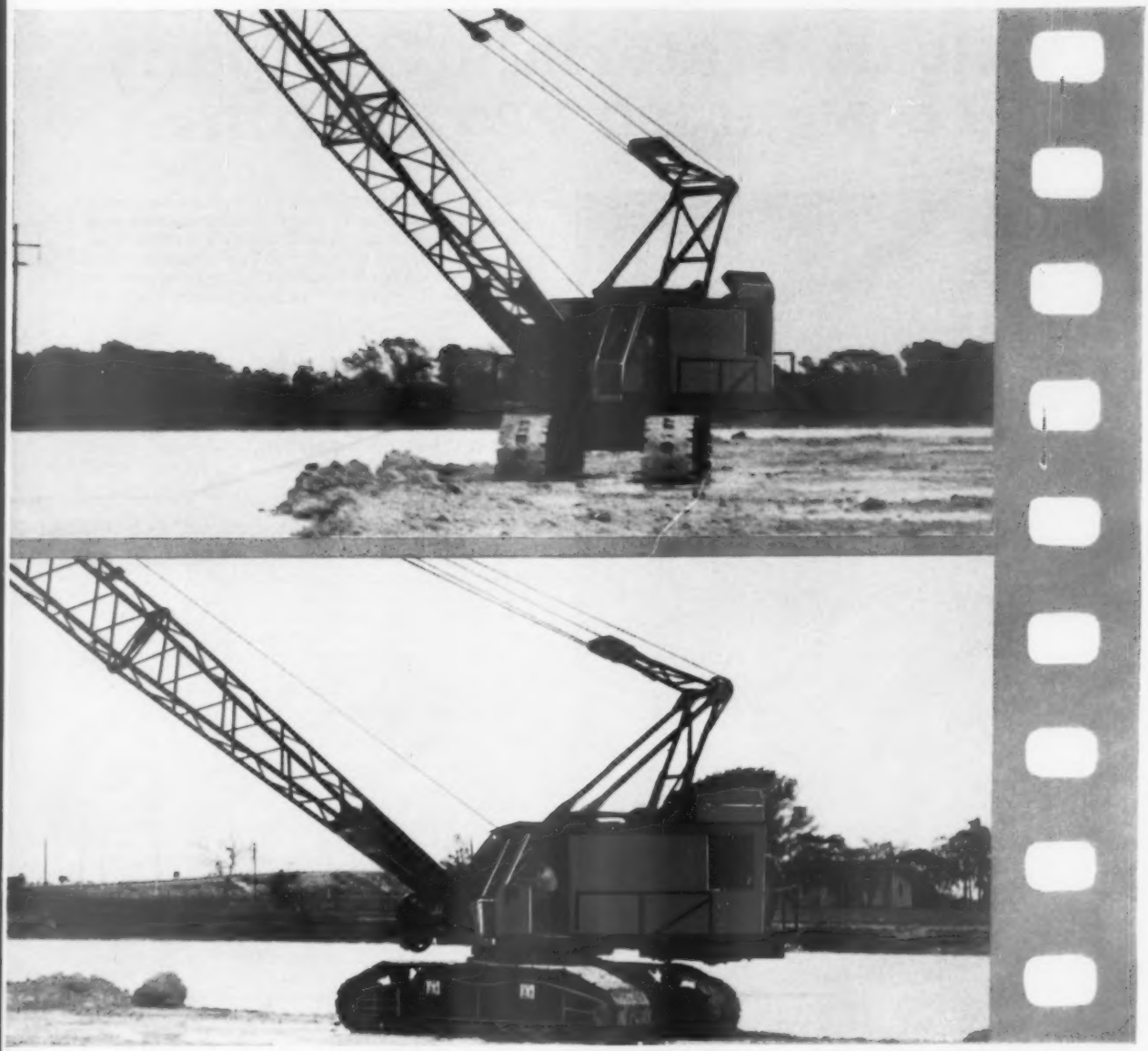

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Cleaning up raw slag from around the grizzly. Powerful tip-back bucket digging action fills bucket quickly.

Loads trucks and hopper cars with crushed expanded slag. Power-steer, power-shift and fast travel give short cycles.

One of the many plants of big Vulcan Materials Company where "PAYLOADER" tractor-shovels play a leading role is at Gary, Indiana. There its Consumers Company Division makes expanded slag products from blast furnace slag and depends on an H-120 "PAYLOADER" to load finished and in-process materials.

Works Two Shifts

Daytimes this unusual machine loads hot, expanded-slag clinker for delivery to the crusher — easily fills a 20-ton truck in 1½ minutes. On the second shift it loads finished materials from stockpiles to trucks and hopper cars — also does clean-up and maintenance chores.

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The fast-acting power-shift transmission, power steer, and air brakes, plus unusually high lift and long reach enable the operator to maintain a high production pace without strain even when loading big hopper cars. A 60-ton car is easily loaded in 5 to 10 minutes, depending on the haul distance. As an operator, Paul Hepner, puts it, "I like this big machine. It handles easier than small ones. The air brakes operate at a touch of the toe, which suits my short legs. The seat is comfortable, all controls are real handy, and visibility is fine."

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The H-120, conservatively rated at 12,000 lb. operating capacity, is the largest of the "PAYLOADER" line of 20 models in 8 capacity ranges. With 300 h.p. diesel engine, 10'10" dumping height clearance and 3'6" dumping reach at maximum height, it has more power, dumping height and reach than anything near its size. It can go from one end of a big yard to the other at better than 25 m.p.h. to give your customers quick, no-wait truck loading service.

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EDITORIAL

by GEORGE C. LINDSAY

Are we losing the battle of safety?

THE ROCK PRODUCTS INDUSTRY must regroup forces and concentrate its attack against what could be interpreted a spiritless approach to safety matters. The combined industry frequency rate jumped again in 1959, for the third time in five years. It was the second highest rate since 1955.

The industry should be thankful that some of its segments have shown much improvement since the middle 1950's. Effect of progress in those industries is to hold down the over-all industry rate. Notably among them are limestone and lime. Cement rock, with the lowest rate of all, has been a consistent contributor toward a lower rock industry rate.

But, taken as a whole, there isn't the progress in rate reduction that there should be and can be. Contrasted to our lack of progress, our brothers in other branches of the minerals industries improved their safety rates in 1959. They showed us up.

Preliminary Bureau of Mines data show the sand and gravel industry rate up 9 percent over the previous year. The cement rock rate is up 14 percent, traprock rate rose 13 percent and gypsum showed a 36-percent increase after a good 1958 record. On the other side of the fence, the lime industry is a shining example of industry segments that have improved safety rates. Its rate fell 19 percent below 1958; it was 24 percent below 1957. The limestone industry improved its rate 8 percent in 1959.

The frequency rates used for this comparison are total injuries per million man-hours of production and development workers. Data for the dimension stone industry were not included in calculations for the rock products industry.

Since management in every one of the six industries covered knows what it takes to get good safety results, why has there been such a wide difference in the degree of success experienced by the several industry segments? For instance, the cement rock industry does work similar to that in the limestone, limerock, traprock and gypsum industries. Yet, the 1959 rate for cement was only 15 percent of the rate for limestone, and a little more than one-fourth the limerock rate, next best rate in the group.

There's proof that good safety records can be obtained. It's no secret that money spent for safety has shown return in actual dollars two for one. Data on how to do the job are easily obtainable. Every industry association and government agency bends over backward to be of help.

Extent of desire and amount of expended effort make the difference. Better increase both, and do it soon, or human suffering and safety costs will continue to increase.

IF YOUR CRAWLERS HAVE "CLASH BOXES" BETTER CHECK THE ADVANTAGES OF THE "EUC" C-6

Without full-power shift even a "brand new" tractor is an obsolete machine in performance and work-ability when compared with the new Euclid C-6 crawler. For the fast response and all-around versatility that's needed in mines, quarries, construction and industrial work, no other tractor has all the advantages you get in the C-6.

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Get the facts on how the C-6 can cut costs on your jobs . . . from dozing and ripping to push-loading big scrapers. You'll find the many operating advantages of this modern tractor will bring you a better return on your investment.

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ROCKY'S NOTES

by NATHAN C. ROCKWOOD

Interlocking the sciences of materials

TREMENDOUS PROGRESS IN ALL SCIENCE has been made and is constantly being made by relatively small groups in very special branches of the various fields of science. Every year, it seems, each science divides into more new special branches. The ever-present problem is an exchange of this special group knowledge with other groups working in similar and even in dissimilar fields. If done efficiently and expeditiously, much loss of time and waste effort would be saved, for ultimately all such new knowledge interlocks. It is in pursuit of this objective that from time to time we devote this page to book reviews on subjects that seem to us so closely related to these industries that our readers should know about them.

Last year the American Society for Testing Materials, long recognizing this problem, established a new Division of Materials Sciences. At its most recent annual convention (last June), it is reported that the papers presented at meetings of this new Division drew large audiences, proving that many, if not most, men working with materials recognize the need for exchange of ideas. "Solid-state theory, properties of semiconductors, ductile ceramics, dislocations and the mechanisms of creep and fracture were among the topics discussed." The newly elected president of ASTM, Dr. A. Allen Bates, is an ideal man to forward such a program, for while his primary interest now is in cement and concrete, his experience has been broad, including metallurgy and ceramics. Moreover, few other scientistis have as wide an acquaintance with science in general and its objectives.

Until structural chemistry was developed, probably few could see any relationship between ceramic materials and concrete. Tests were developed for each material as though it was unique. Now, of course, it is known that the structures of all materials have much in common, and the real objective of scientific research—and testing—is to learn what gives them the properties they possess, and how those properties may be taken advantage of, or improved upon, to better purpose.

The development of an ASTM division to try to discuss in general terms the materials sciences is a good beginning, but the real test will come when the various groups meet together to discover for themselves that helpful suggestions and useful knowledge often come from unexpected sources. For example, cement and concrete groups could well meet occasionally with the group interested in ceramic products (cement, of course, is technically a ceramic product). Structures of clay in a ceramic product must bear some resemblance to those of portland cement clinker. Cement researchers have learned much from the structure of blast-furnace slag, and probably could learn much more by more intimate contacts with slag researchers. And, since concrete manufacturers are trying to produce a superior "artificial" stone, they could probably learn much from the groups especially studying the properties of natural stone.

These ideas occur to us at this time because we have before us a new book for review entitled Mechanical Properties of Non-Metallic Brittle Materials.* This book consists of the Proceedings of a Conference on Non-Metallic Brittle Materials, organized by the Mining Research Establishment of the National Coal Board in consultation with the Building Research Station (D.S.I.R.) and held in London, England, in 1958. The editor of this compilation is W. H. Watson, assistant director, Mining Research Establishment, National Coal Board, of Great Britain. The title itself is intriguing. Surely, concrete is a brittle non-metallic material. Possibly we can learn something as to how it compares with similar materials.

The foreword by Sir Harry Melville, secretary of the Department of Scientific Industrial Research,

Please turn to page 149

*Interscience Publishers, Inc., 250 Fifth Ave., New York 1, N.Y., price $12.75

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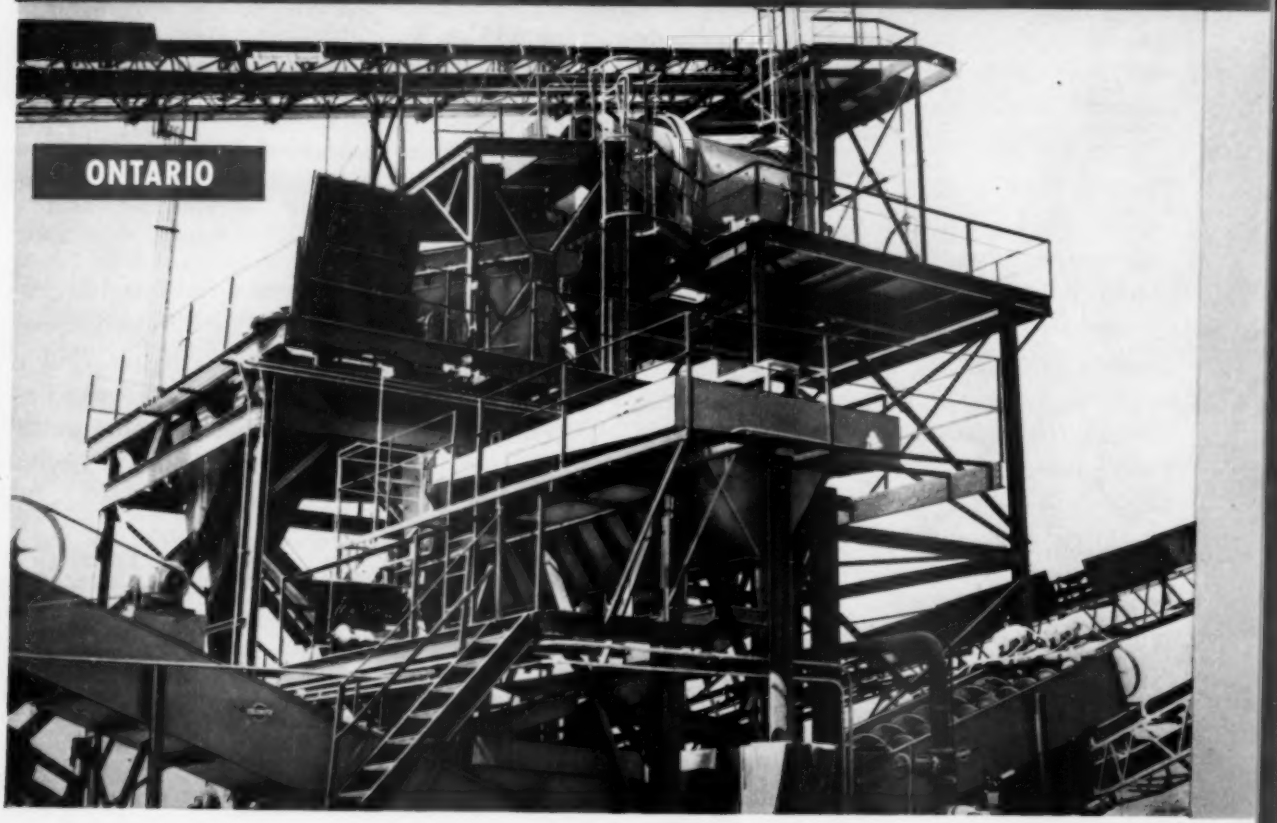

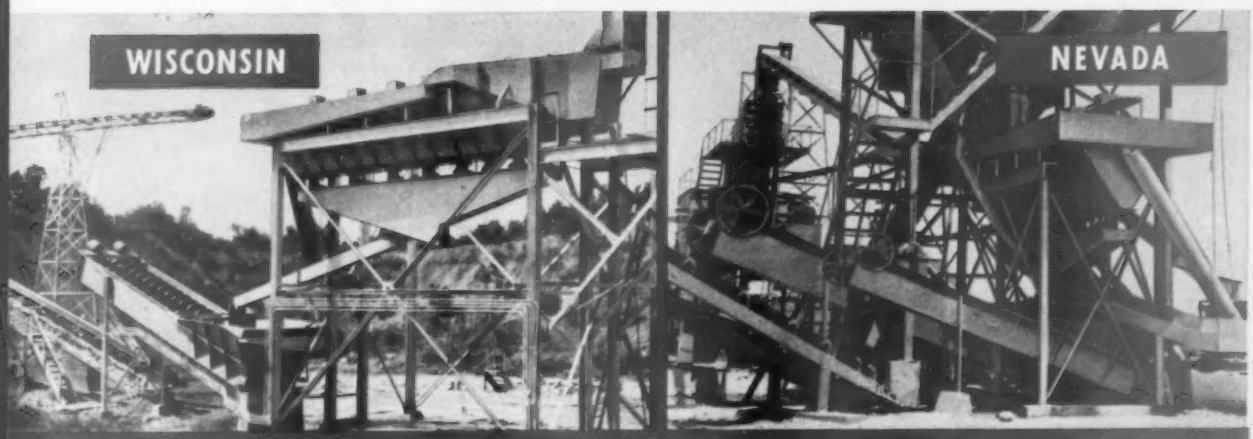

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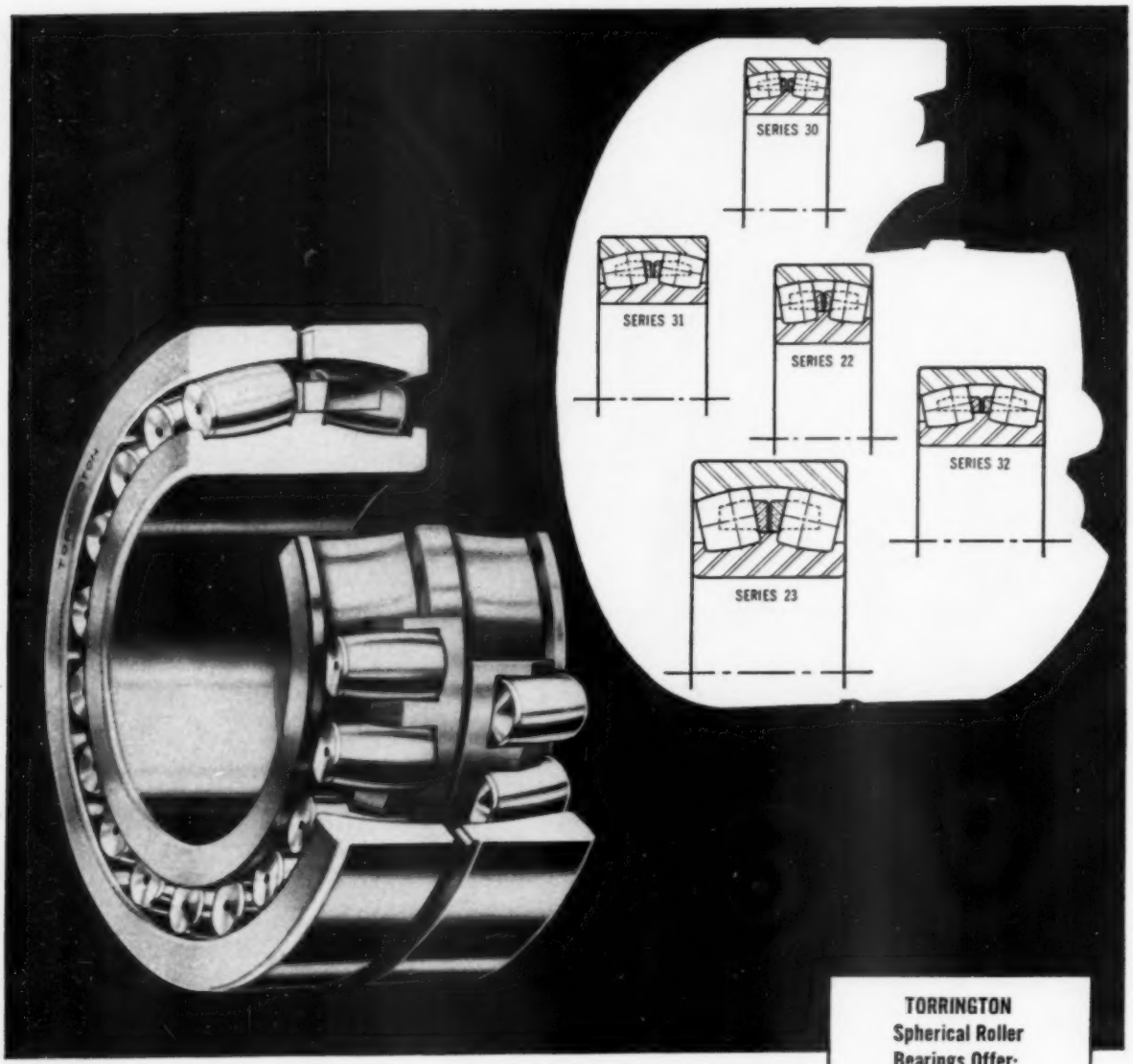

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WASHINGTON LETTER

by EDGAR POE

World's largest Concrete mixer Used at Dulles

The largest concrete mixing plant in the world has been in use in connection with the construction of the newest, largest and mose expensive civil airport in the world some 25 miles west of the nation's capitol. The $100 million Dulles International super jet-age airport covers 9,800 acres of land in the Virginia countryside with the Blue Ridge Mountains in the background. The airport will be opened in about 15 months.

The large concrete mixing plant involved three 10-cu. yd. mixers. Concrete was poured from the mixers into 6-cu. yd. trucks and quickly hauled to the runway or taxiway. Stone for the runway's base and for the concrete was hauled from an adjacent quarry. The huge crushers processed enough stone for 5,000 yd. of concrete a day. Sand used in the concrete mixture was hauled from Richmond, Va.

The runway base is 9 in. of crushed stone, and the shoulders are 2 in. of asphaltic concrete poured over 4 in. of crushed stone, 25 ft. wide. During the runway paving more than 3,000 lighting bases were set flush in the concrete.

The world's largest earth-moving equipment, including the huge LeTourneau earthmover, which alone is capable of moving 100 cu. yd. of earth at one time, has been employed in the International Airport which Congress authorized. The first earth-moving began in October 1958. A proposed 27-mile expressway is scheduled to connect the city of Washington with the airport.

Labor is Ringing Door bells

Who is going to do the door bell ringing and knocking? A substantial part of the hard-hitting campaigning is being done by the rank and file of labor. The labor leaders are staging the biggest drive to elect the men and women of their choice that they have ever undertaken in American politics.

Passage of the Landrum-Griffin bill helped to spur on the labor chieftains to try and elect people that will rally to their causes.

Why has labor grown so powerful in the United States? There are a series of reasons, of course. However, a paramount reason that labor has gotten so strong is because its members have worked in the precincts and wards of the various states to send their men and women to the state capitols and to Washington.

Most businessmen, whether they are head of a foundry or engineering company, or in the rock products field, have been prone in the past to "let George do" when it came to politics.

Their excuse generally has been: "I can't afford to get mixed up in politics." The day has come when such an excuse is unpardonable.

If they expect to conduct a healthy, profitable business, it is time they roll up their sleeves and really get mixed up in politics.

The day has come when they cannot afford not to get mixed up in politics.

The Walter Reuthers and the Jimmy Hoffas are up to their necks in politics. They can afford to get mixed up in politics.

Businessmen Should get In politics

The Democrats and the Republicans have formidable presidential tickets conducting one of the liveliest campaigns in modern history. Next January, either Richard M. Nixon and his family or John F. Kennedy and his family will move into the White House, 1600 Pennsylvania Ave., N. W., the most famous address in the world.

Next January, there will be numerous new faces in the House and Senate on Capitol Hill. The Democrats are certain—as certain as anything in politics can be—to continue in control of the Senate. Odds are also strongly in favor of the Democrats keeping control of the House.

There are millions more registered Democrats in the United States than Republicans. There will be 8,000,000 new voters that will cast their first presidential ballot on November 8. And, there will be 5,000,000 more women voters than men.

Unquestionably, there is going to be more door bell ringing in the current presidential campaign before the curtain is rung down on Monday night, November 7, than any time in history.

Congressman Lashes out at Road critics

Representative Gordon H. Scherer, Republican of Ohio, has struck back at critics of the Bureau of Public Roads, State highway departments and consulting engineers. A member of the Special House Subcommittee on the Federal Aid Highway Program, Congressman Scherer declared that some people, in and out of Congress, "panicked" when federal aid funds were curtailed. Some of these critics made political hay out of the highway crisis.

"They looked for scapegoats," said the ranking minority member of the Roads Subcommittee. "The Bureau of Roads and State highway departments became the chief whipping boys and so did private consulting engineers."

The Ohioan declares that he would be the last to say that in a program so vast as the mighty highway building program involving millions of people, both in government and in private industry, "you are not going to have some mistakes, inefficiency, waste and even fraud. As far back as 1956 I discussed at length in Congress the necessity of having a committee maintain constant surveillance over this program."

"One of the principal charges," he said, "was that the Interstate System was over-designed; that the rights-of-way were too wide and the interchanges too complex, and that the entire highway layout was adorned with too many frills. It was then that the roof really fell in on the consulting engineers.

"These charges of over-design were the answer to the professional bureaucrats' prayer, the boys who believe in bigger and bigger government and the paternalistic, all-powerful state. For some time, these professionals have been attempting to build up and expand the engineering departments of the federal government."

Both parties Make pledges On resources

Both major political parties at their 1960 conventions inserted planks in their platforms concerning our natural resources. The Republicans at Chicago called for long-range minerals and fuels planning. They pledged "continued support for federal financial assistance and incentives under our tax laws to encourage exploration for domestic sources of minerals and metals, including reasonable depletion allowances."

The GOP also pledged support of the historic policy of Congress in preserving the integrity of the states to govern water rights; continued federal support for "Republican-initiated research and demonstration projects" which will supply fresh water from salt and brackish water sources; recognition of urban and industrial demands by making available to states and local governments, federal lands not needed for national programs, and development of new water resource projects throughout the nation.

The platform of the Democrats at their Los Angeles convention declared that America uses half the minerals produced in the free world. Nevertheless, the Democratic platform said the mining industry appears to be in the initial phase of a serious long-term depression. Therefore, the party of the donkey went on record for a long-range minerals policy.

Under the "natural resources" plan, the Democrats declared that fresh water, so vital to our economy, is a national problem. Therefore, with a Democrat in the White House, the party pledged a comprehensive national water resourse policy.

"America can no longer take pure water and air for granted," said the platform. "Polluted rivers carry their dangers to everyone living along their courses; impure air does not respect the boundaries. Federal action is needed in planning, coordinating and helping to finance pollution control. The states and local communities cannot go it alone."

Hundred million Motor vehicles Expected in 1970

In 1945, about the time Japan surrendered formally to the United Nations, there were nearly 5,000,000 trucks on the highways of this country, and five years later, there were 8,000,000. As 1959 came to a close, there were approximately 11,000,000 in use.

The Bureau of Public Roads now estimates that by 1961 there will be 77,000,000 motor vehicles of all kinds on the streets and highways, and by the time the 1970 decennial census is taken, there will be more than 100,000,000 vehicles in use.

Because of the growing number of vehicles and greater congestion that apparently lies ahead, the Bureau of Roads is doing more and more engineering blue-printing for the urban areas. The Bureau has a department dealing with urban problems set up to assist the states and metropolitan areas.

Travel demands during the next decade are expected to reach staggering proportions as the Nation becomes more and more urbanized. A number of metropolitan areas of more than 1,000,000 population will be chalked up during the coming decade.

Few people, if any, will dispute that highway transportation is not only a substantial economic factor, but it has become a great part of our life.

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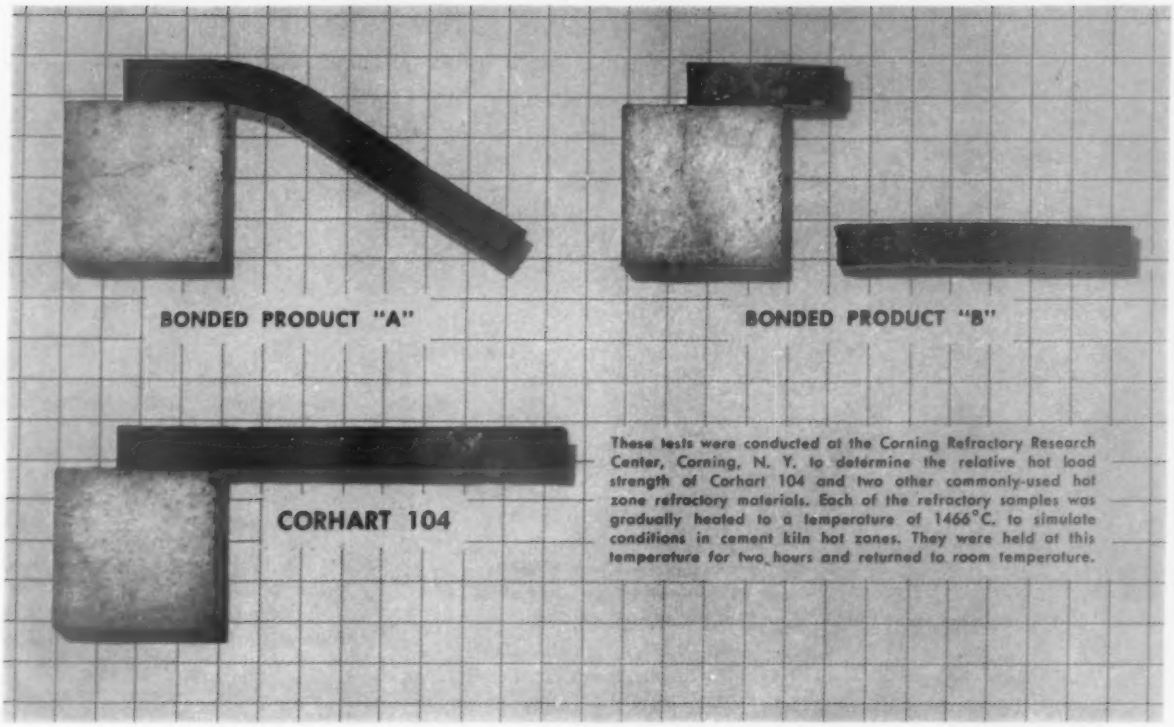

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MANY leading cement producers are substantially increasing kiln output by utilizing Corhart 104 as their hot zone refractory. Its extremely high hot load strength (see above) is one of the primary properties responsible for helping eliminate costly premature repair shutdowns.

Corhart 104 is manufactured by an exclusive fusion cast process which creates a strong, non-porous interlocking crystalline ceramic structure. It is electrically-melted at temperatures exceeding 4500° F., giving it a built-in 1000°F. "margin for error." The high hot load strength of Corhart 104 gives you a stable refractory unaffected at temperatures where conventional basic refractories begin to soften.

High hot load strength is only one of *many* Corhart 104 properties responsible for its superior resistance to the abuse of thermal cycling, sustained high temperatures and abrasion in the most severe wear areas of cement kilns. As a result, Corhart 104 consistently outlasts other hot zone refractories by at least 2-to-1.

A Corhart engineer will be glad to help you better utilize conventional refractories in a Corhart "Balanced Lining." Corhart Refractories Company, Incorporated, 944 Commonwealth Bldg., Louisville 2, Ky.

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LABOR RELATIONS

A ROUNDUP OF ACTUAL DAY-TO-DAY IN-PLANT PROBLEMS AND HOW THEY WERE HANDLED BY MANAGEMENT MEN

How would you decide?

If an employe takes 3-days' leave to attend a funeral, do you have to pay him if he didn't show up for the services?

What Happened: When Parkinson's step-brother died, the employe asked for a 3-day leave to attend the funeral. In accordance with company policy, this was granted.

Subsequently the company discovered that Parkinson did not attend the funeral and it docked three days from his pay.

Parkinson insisted that he didn't have to attend the funeral to be eligible for the 3-day leave.

The company said, "A funeral leave is for the purpose of attending the funeral. Otherwise, why do you need three days off with pay?" Parkinson took his grievance to arbitration.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Marcus ruled: "Under the contract, the granting of 3-days' funeral leave to employe attending funeral of member of his family is specified. However, the employe who was away from work for three days upon death of his step-brother, with whom he had been raised, is not entitled to 3-days' pay, there being no evidence that the employe attended the funeral."

If a probationary employe is more capable than a regular worker can he be promoted to a higher-rated job?

What Happened: John Kelso was a 7-year man. He got an offer from another company and took it. But that job didn't work out so he returned to his original outfit as a new hire. While he was on probation, a job vacancy

opened up and Kelso, together with 3 other employes applied. Of the 4 applicants, Kelso had the most experience. He had done that kind of work before, while the others would have needed some training in order to meet standard.

The foreman picked Kelso on the grounds that his experience was so superior that he couldn't be overlooked. The company had a policy which read: "Seniority will apply in filling new jobs, vacancies, transfers, layoffs, recall from layoff. The employe must have the ability to meet the job requirements. In applying the rules of seniority set forth herein, due measure of regard shall be given by the company to the following factors: (1) seniority, (2) qualifications and ability, (3) physical fitness in meeting the job requirements. Where all such factors are relatively equal, the employe with greater seniority will be given preference."

Management maintained that Kelso's ability was so far above the others that seniority was not a factor to be considered.

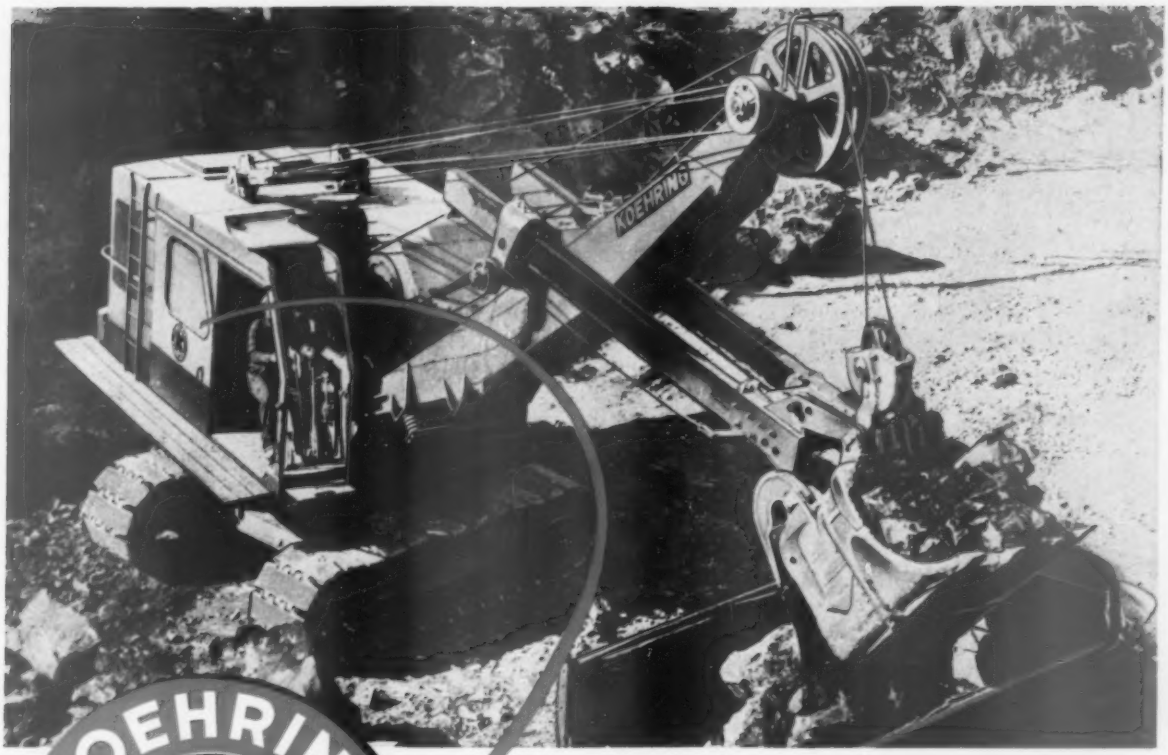
Was the company:
Right? ☐ **Wrong?** ☐

What a Board of Arbitration ruled: "The basic issue is whether the company violated the agreement by selecting a probationary employe. In the opinion of the Arbitration Board, John Kelso was the most highly qualified person to fill the job. His experience put him head and shoulders above the other three employes who had no such experience.

"However the matter of seniority is involved. Section C of Article XVII specifically required that due consideration shall be given to 3 factors: seniority, qualifications and ability, and physical fitness. A careful reading of the Seniority Article would lead to the conclusion that an employe must possess, in varying degrees, all three factors, including seniority.

"It was stipulated that Kelso had no seniority when he was selected. He was still a probationary employe. Section A explicitly provides that during such probationary period he shall not be regarded as 'a regular employe.' Since he was not a regular employe, he had no competing rights in the 'application of seniority.' Thus, despite his excellent qualifications, he was not eligible to be considered."

(Continued on page 34)



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Take the front end, for instance. The big tough rock boom, double dipper sticks, rugged chain crowd, and long wearing dipper give you real *heavy duty* dependability at the business end. Or take the crawlers. Each individual shoe actually is strong enough to support the *entire machine,* plus its rated load. Or take the main machinery. Shafts are kept in perfect alignment because side stands are line bored in place as a unit.

Yes, Koehring *means* Heavy Duty. That's why you can *expect* more from a Koehring excavator . . . why you *get* more from a Koehring.

K18

MORE WORK CAPACITY...

MORE PROFIT PER DOLLAR INVESTED

KOEHRING

DIVISION OF KOEHRING COMPANY

Milwaukee 16, Wisconsin

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continued from page 32

If a company produces a new product, can it hire new workers instead of using "regulars"?

What Happened: When the company launched a new product, it wrote out detailed job descriptions for those who were to work on the new jobs. One of the requirements was that each employe who applied must pass a test in order to qualify. A number of employes took the exam and failed it. When this happened, the company advertised for help and filled the new jobs with workers from outside. The old-timers protested:

1. We must be given an opportunity to work on the new jobs. We don't feel that the work is very different from what we've been doing in the past.
2. You never before used tests, so why start now?
3. What good is seniority if the company can skip over us like this?

The management put in a defense:

1. These are newly created jobs and the qualifications are much higher for them.
2. We certainly can give tests if we want to. How else can we judge ability and potential?
3. The senior employes do not have the experience for handling these new tasks—so we do not have to use their background with the company as a basis for selection.
4. Seniority is okay only if the employe actually has the ability to do a promoted job.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Klamon ruled: "Seniority provides preference for jobs only where jobs exist. If jobs are eliminated, changed or otherwise become unavailable, seniority offers little protection to the employe. The Arbitrator finds that the duties of the new jobs were totally dissimilar and utilized a higher degree of skill. Therefore the company had every right to require employes to pass certain tests in order to qualify for the new production line. The new jobs did not require the skills of the senior employes, and thus did not have to respect their seniority."

If work slackens, can you lay off a union officer?

What Happened: Joe Hageman was a shop steward. Because of this, he had top seniority in the department. The union contract clearly said so. One day the supervisor came over to Joe and told him that he had no work for him and would have to lay him off. Joe didn't complain about this.

When he was called back to work 30 days later, he claimed that the company owed him pay for the period of his enforced idleness. He put it this way:

1. I am a union official. Therefore I'm entitled to top seniority. That means I should be the last one to be laid off in the department.
2. The foreman should know I had top seniority even if I didn't say anything.
3. I was out for a whole month while other employes were kept on.

The company used two arguments in rebuttal:

1. When Joe was laid off he didn't put in for another job—so in effect he agreed not to exercise his super-seniority at that time.
2. There was no work around that Joe could do.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Howlett ruled: "Special seniority is provided by the collective-bargaining agreement for union officials to assure representation of employes in the area served by them; and conversely, to assure the employer that there will be an official on the job to represent the employes' collective-bargaining representative. Management is not relieved of all responsibility when it becomes necessary to lay off a union official. The super-seniority system is for the benefit of both the company and the union; and, in the opinion of the Arbitrator, the company may not dispense with the services of a committee member solely because he did not request another job at the time of the layoff. Joe Hageman is entitled to be paid."

Can you fire an employe who falsified his employment application four years ago?

What Happened: When Bill Blane returned to his job from a sick leave he was sent to the company's doctor for a routine checkup. The medic found that Bill had a bad back and recommended that the employe be taken off his regular job and be given lighter work to do. When Bill returned for a new assignment, the personnel department took a good look at his employment application and found that under "physical limitations" he had put "none".

The facts came out that Bill had injured his back in the army and, indeed, he was still classified by the Veterans' Administration as having a 40 percent disability.

The employe was fired for falsifying his employment application. At arbitration, Blane took this position:

1. In applying for a job, everyone tells a "little white lie."
2. I've done a good job right along. In 4 years of work I've had only one relapse.
3. You can't fire an employe for falsifying his application after he's worked for you so long.

The company answered:

1. If we knew about the back injury we would not have hired the man.
2. We don't want to take responsibility for a man whose injury might get worse.
3. Blane didn't tell a "little white lie." He told a whopper.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Seward ruled: "Deliberate falsification or misrepresentation for the purpose of securing employment is a serious offense. It results in an employment transaction which is based on fraud and deceit. It is clear that the company could not hire."

END

VERSATILE CAT DW20-SCRAPER

MAKES SHORT WORK OF EVERY JOB

Cat DW20G-456B dumps onto a conveyor at Rhodes and Jamieson's Fremont plant.

Big loads to the crusher; high-speed hauling; and fast, low-cost stripping with the same machine slash costs for sand and gravel plants. This is the all-job performance Rhodes and Jamieson, Ltd., of Fremont, Calif., expect and get from their five Caterpillar DW20-456 Tractor-Scrapers.

At Fremont, three DW20s, pushloaded by a Cat D9 Tractor, speed sand and gravel 2,000 yards to the washing and screening plant. At nearby Pleasanton, two DW20s, also pushloaded by a D9, easily supply material on a ¼-mile haul. The same scraper fleets also strip overburden to further reduce costs.

Cat-built equipment has been first choice for Rhodes and Jamieson since the Fremont plant opened in 1951. The high-production, low-cost DW20G-456B handles the toughest loading and hauling jobs. The DW20G's 345 HP (max. output) turbocharged Cat Diesel Engine provides travel speeds to 35.8 MPH. Its 456B LOWBOWL Scraper carries 19.5 cu. yd. struck, 27 cu. yd. heaped. Optional SynchroTouch Transmission Control lets the operator simply dial the desired gear for automatic, split-second shifting.

Find out how you can cut your equipment and production costs with this all-purpose earthmover. Call your Caterpillar Dealer.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

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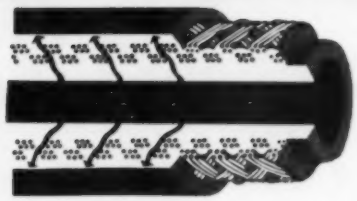
HIGH PRODUCTION AT LOW COST— THE DW20-456 TEAM



"MORE USE PER DOLLAR"

Rubber tie-gum penetrates Homoflex braided plies to provide an inseparable tube-to-cover bond. More flexible and lighter weight than any hose for equal pressure.

R/M HOMOFLEX HOSE HANDLES EASIER...LASTS LONGER

Homoflex Air Hose is mandrel-made with *no* pre-set twist—it coils and uncoils freely in *any* direction *without* kinking! It's the easiest handling hose you can use with air drills. Exclusive Homoflex construction makes strength member and tube virtually inseparable, assures long, trouble-free service life. Uniform inside and outside diameters permit faster, easier, *safer* coupling . . . faster, fuller flow.

Strong, light weight, and "flexible as a rope", Homoflex Air Hose adds up to real labor and cost savings on the toughest jobs. Homoflex H.D. Air Hose is also available for extra heavy duty and *with yellow cover stripe* for visibility; also in type for water in mine use.

- **SUPER STRONG**
- **PRECISION BUILT**
- **LIGHT WEIGHT**
- **FLEXIBLE AS A ROPE**

Write for Bulletins M610 and M694.

RM-1017

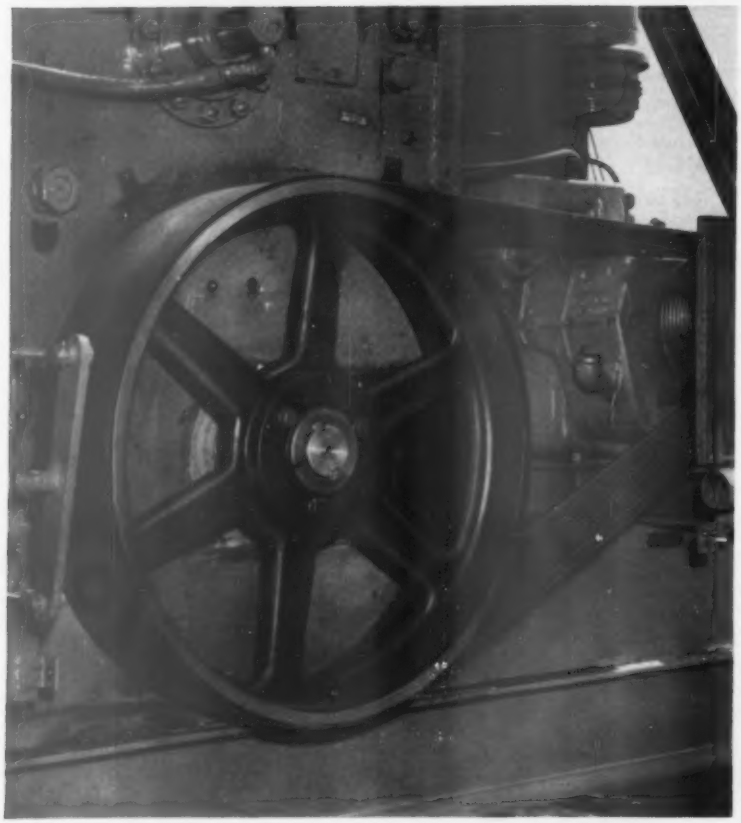
RAYBESTOS-MANHATTAN, INC.
MANHATTAN RUBBER DIVISION, PASSAIC, NEW JERSEY

RM

ENGINEERED RUBBER PRODUCTS ..."MORE USE PER DOLLAR"

RAY-MAN CONVEYOR BELT *Engineered for 45° Idlers*

You can now get up to 60% greater hauling capacity—save up to 20% on conveyor costs—as compared to using regular 20° idlers. Ordinary ply belts are too stiff and boardy to do the job—Ray-Man's exclusive flexible construction and built-in stress compensation is *guaranteed* to take the sharp angle of 45° idlers *without* ply or cover separation at the hinge line. Learn how Ray-Man Conveyor Belt opens up a whole new era of conveyor design . . . permitting larger loads . . . narrower conveyors —assuring longer cover wear, lower handling costs! Write for Bulletin M303.



CONVERT TO R/M POLY-V® DRIVE FOR MORE POWER IN LESS SPACE... *with Reliability*

- SINGLE UNIT V-RIBBED DESIGN
- ELIMINATES BELT "MATCHING" PROBLEMS
- MAINTAINS GROOVE SHAPE
- CONSTANT PITCH AND SPEED RATIOS
- LESS WEAR ON BELT AND SHEAVES
- COMPLETE CONTACT-PRESSURE

Just two Poly-V belt cross sections meet every heavy duty power transmission requirement.

R/M Poly-V* Drive is the smoothest and coolest running —*longest wearing* drive you can install. Discuss your application with an R/M Distributor . . . or write for Poly-V* Drive Bulletin M141.

**Poly-V is patented by Raybestos-Manhattan, Inc.*

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PEOPLE IN THE NEWS

Alfred C. Olsen

Marvin C. Grisham

Alexander Dolgos

National Gypsum Co. appoints three plant managers

ALFRED C. OLSEN has been appointed manager of the Savannah, Ga., plant of National Gypsum Co., Buffalo, N.Y. He succeeds John J. Burns who has retired after more than 34 years of service. Mr. Olsen was formerly manager of the Westwego, La., plant and will be succeeded by Marvin C. Grisham, manager of the Portsmouth, N. H., plant. Alexander Dolgos, production superintendent at Baltimore, has been appointed manager at Portsmouth.

Mr. Olsen began his career with National Gypsum in 1937 as a tester in the Clarence Center laboratory. Two years later he was promoted to quality supervisor at the Savannah plant. In 1951 he was appointed manager of the Portsmouth plant, where he served until 1955 when he became manager of the Westwego plant.

Mr. Burns joined the company in 1926 as mill and board plant superintendent at Clarence Center, N.Y. Two years later he was appointed board plant superintendent of the new plant at National City, Mich. The following year he was promoted to plant manager at Clarence Center. In 1936 he was named production manager for gypsum plants, and in 1947 became manager at the Savannah plant.

Mr. Grisham joined National Gypsum in 1957 as production superintendent of the Bronx, N.Y., gypsum plant.

Mr. Dolgos became associated with the company in 1936 as a tester in the Bronx laboratory and was appointed assistant quality supervisor in 1946. The following year he was named quality supervisor at the new Baltimore plant, and in 1954 assumed the additional duties of process control engineer. For the last three years he has been production superintendent at Baltimore, Maryland.

Pratt and Ransom appointed Michigan Limestone managers

CLIFTON A. PRATT (left) has been named manager of the Hillsville, Pa., plant and quarry of the Michigan Limestone Division of U. S. Steel Corp. William R. Ransom (right), who has been assistant to the Northern district manager, succeeds Mr. Pratt as plant manager of the Cedarville, Mich., plant and quarry. William R. Crow, formerly district engineer of the Northern district, has been named budget and appropriations engineer at Detroit, and George L. Robbins, acting manager at Hillsville, has been made district engineer for the Northern district at Rogers City.

Mr. Pratt, who has been with the division since 1939, is a native of Terre Haute, Ind., and an engineering graduate of Rose Polytechnic Institute. He joined the corporation as an engineer at the Annandale mine of the Pittsburgh Limestone Co. He served as manager of the Kaylor mine from 1946 to 1955 when he was appointed manager of the Moler quarry. In 1957 he was assigned to the Cedarville plant.

Mr. Ransom, a native of Pontiac, Mich., is an engineering graduate of Michigan State University, and has been with Michigan Limestone at the Calcite plant since 1953. He has

worked successively as an engineer assistant, assistant quarry superintendent and quarry engineer, and assistant to the district manager of the Northern district.

Mr. Crow is a native of Aberdeen, S.D., and an engineering graduate of Purdue University. He has been with Michigan Limestone since 1947.

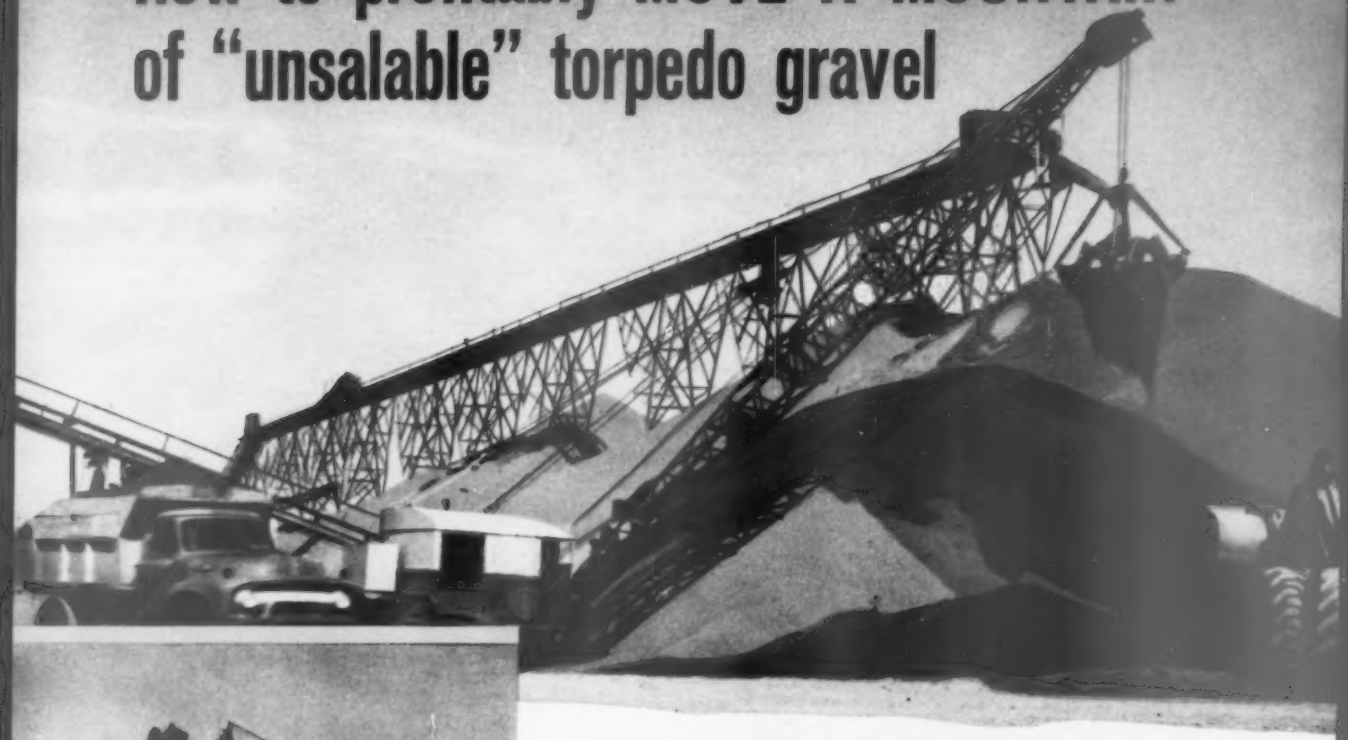
Mr. Robbins, a native of Boston, Mass., is an engineering graduate of Michigan State University and has been in the engineering department of Michigan Limestone since 1951.

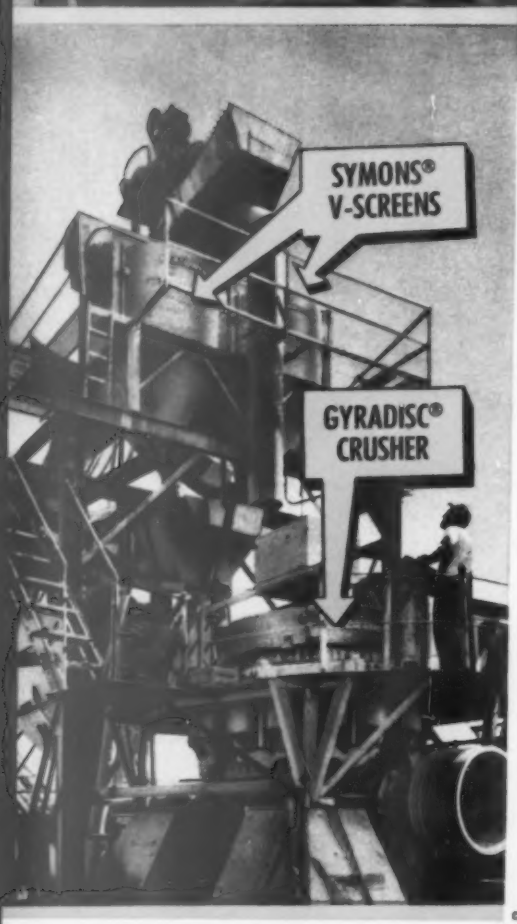
ASTM staff changes

RAYMOND E. HESS, associate executive secretary, has been named acting executive secretary of the American Society for Testing Materials, and Robert J. Painter, executive secretary since 1952, is to be consultant to the executive secretary. Mr. Painter will continue as treasurer of ASTM, and will give concentrated attention to long-range planning work. These

(Continued on page 42)

How to profitably MOVE A MOUNTAIN of "unsalable" torpedo gravel





When a mountainous pile of unsalable torpedo gravel threatened to engulf its plant property, Winter Bros. Material Co., Fenton, Missouri, producers of sand and gravel in the St. Louis area relieved their space problem and turned the big liability into a tidy profit. This was accomplished by the installation of a 54-in. Gyradisc Crusher and two Symons V-Screens. The Gyradisc converts ⅜-in. torpedo gravel (pea gravel) into salable, manufactured sand and another premium product, a filter medium, is produced through one of the two Symons V-Screens. The other V-Screen dewaters the torpedo gravel before crushing.

At present, the Gyradisc Crusher and the two Symons V-Screens handle a daily production of up to 500 tpd on intermittent operation.

In many operations, Gyradisc® Crushers supplement Symons® Cone Crushers for volume production of fine specification material. They are used for the production of agricultural limestone, limestone chips, sand, rock dust, crushed stone for asphalt mix and the fine reduction of asbestos, slag, talc, etc.

Write for Bulletin 228.

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SYMONS . . . A registered Nordberg trademark known throughout the world.

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SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • JOHANNESBURG • LONDON • MEXICO, D. F.

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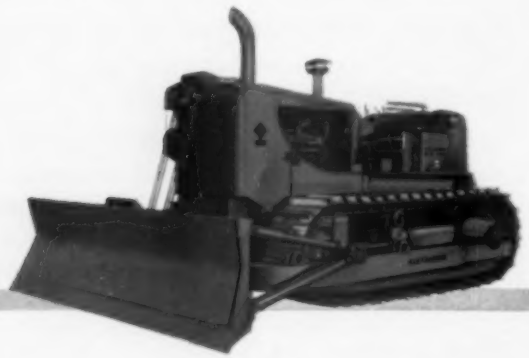
Whether your choice is the 225-hp HD-21 or the 150-hp HD-16, you get from 8½% to 27% more efficient engine operation than from other crawlers.

This fuel-pinching efficiency is a fact! Your Allis-Chalmers dealer will show you actual proof of up to 27% fuel savings in the Allis-Chalmers 16000 or 21000 engines over units of comparable size. He'll tell you why they run cleaner . . . how they "sip" fuel to earn the title "industry's healthiest engines."

Six crater-shaped pistons develop 225 hp in the HD-21, 150 hp in the HD-16 . . . both at an easy 1825 rpm. Coupled with torque converter drive, they provide plenty of rough dozing lugability . . . all the power you'll ever need.

These big Allis-Chalmers tractors are built for mighty tough service. Shock-absorbing all-steel main frame, durable double-reduction final drives, certified permanent lubrication of tapered roller bearing truck wheels, idlers and rollers, and extra tough track keep them going season after season with a minimum of maintenance. Your Allis-Chalmers construction machinery dealer will be glad to show you an HD-21 or HD-16 soon. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



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ALLIS-CHALMERS

power for a growing world

PEOPLE IN THE NEWS

(Continued from page 38)

changes were necessitated by Mr. Painter's long continuing convalescence from several hip operations.

Mr. Hess, who will continue as technical secretary and editor-in-chief, was for many years assistant secretary, becoming associate executive secretary in 1952. He has been with ASTM since 1920.

Glenn Hatch elected Hercules president

GLENN M. HATCH has been elected president of Hercules Cement Div. of American Cement Corp., Philadelphia, Pa. Mr. Hatch, who has been active in the cement industry for 32 years, was formerly vice president of sales for Hercules. He replaces James P. Giles who was recently elected executive vice president of the American Cement Corp.

Mr. Hatch joined Hercules in 1947 as district sales manager in the New England area, became assistant sales manager in 1953 and was elected vice president for sales in 1958. He is a graduate of the University of Notre Dame with a bachelor of philosophy degree in commerce and attended the Advance Management Program at the Harvard Business School.

PCA district engineer

HOMER A. HUMPHREY has been appointed district engineer of the southern New England district of the Portland Cement Association, succeeding Malcolm S. Loring, who has resigned.

Mr. Humphrey, a graduate of Michigan College of Mining and Technology, joined PCA in 1937 as soils engineer. Two years later he became regional soil-cement engineer in the Midwest regional office where for the past 18 months he has served as regional paving engineer.

Universal Atlas treasurer

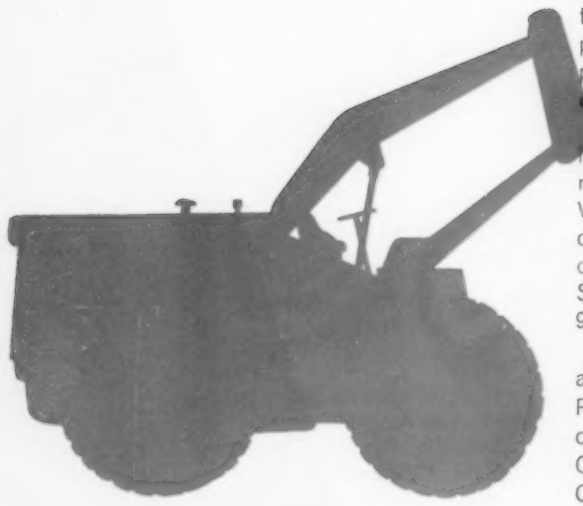
ROBERT A. RAGGIO has been appointed treasurer of the Universal Atlas Cement Div., U. S. Steel Corp. A native of New York City, Mr. Raggio succeeds Clarence A. Keeley who has retired.

(Continued on page 46)

CUMMINS V DIESELS
MORE COMPACT
MORE POWERFUL

CUMMINS

ADDS A 700HP V12 DIESEL TO A GROWING LINE OF CONSTRUCTION ENGINES



Newest of the V diesels from Cummins is the VT12-700. A real workhorse. It's big in horsepower, but not in size. Truly the most compact, most powerful highspeed engine on the market. And turbocharging permits full rated horsepower up to 10,000 feet.

Like the VT-700, the new, naturally aspirated V12-525 has features that will reduce operating costs. Both 12 cylinder engines have internal fuel and oil lines which eliminate damage to exposed tubing and connections. The revised PT fuel system automatically compensates for wear—needs only the simplest maintenance. A basic block improvement gives you a stronger, more durable engine.

The increased power of these new diesels is a natural advance from the famed VT-600 and NVH-450. For more than ten years these two models have had the field to themselves. Only Cummins could better their proven performance. How? By redesigning the cylinder area to permit higher horsepower at no increase in engine size *or engine wear.*

This big bore feature is also part of the V diesels at the lower end of the line . . . the V8-350 and the VT8-430. All new, all power from the pan up, they're the first 8 cylinder V diesels in this horsepower bracket built specially for construction equipment. Every kind of application, every operating condition was considered in their design. Service is easy because all accessories are mounted in the 90° angle between the cylinder banks.

Be assured of continued low operating costs with Genuine Cummins Parts and qualified service. For the complete profit story, see your Construction Equipment Dealer or Cummins Distributor.

CUMMINS

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International Sales & Service • Cummins Diesel International Ltd., Nassau, Bahamas • Cable: Cumnas
Overseas Factory • Cummins Engine Company Ltd., • Shotts, Lanarkshire, Scotland

6-17-60

V8·350 HP

VT8·430 HP

NVH·450

V12·525 HP

VT·600 HP

VT12·700 HP

PEOPLE IN THE NEWS

(Continued from page 42)

V. E. Wessels promoted by Ideal Cement Company

VINCENT E. WESSELS, formerly assistant to the president of Ideal Cement Co., and vice president of Great Western Aggregates, Inc., has been promoted to director of technical research and exploration of Ideal, and executive vice president of Great Western Aggregates, Inc.

Harry M. St. John has been named to succeed Mr. Wessels as executive assistant. Mr. St. John has had wide experience in engineering, technical sales and general management.

Phoenix Cement announces personnel assignments

DON L. ROGERS has been promoted from director of personnel to assistant to the president of Phoenix Cement Co., Phoenix, Ariz., and Kenneth A. Tobias has been appointed marketing analyst.

Mr. Rogers, a graduate of Brigham Young University, Provo, Utah, joined Phoenix Cement Co. in 1958 as director of personnel, immediately after graduating from Harvard Business School.

Mr. Tobias was formerly coordinator of long-range planning for Rheem Manufacturing Co., Chicago, Ill. He is a graduate of the University of Richmond and Harvard Business School.

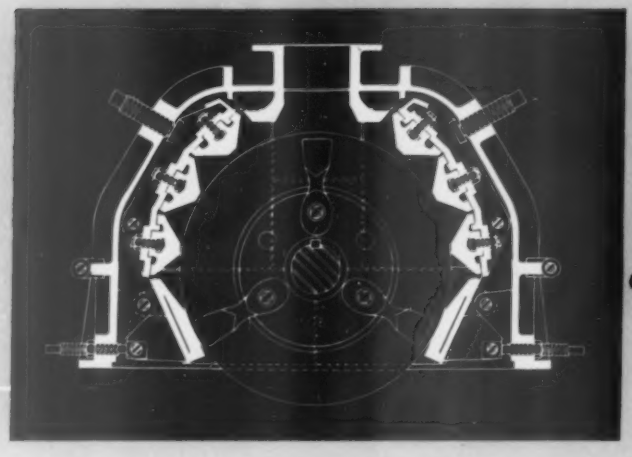
Seymour Fleming appointed NCSA committee chairman

SEYMOUR B. FLEMING, safety director of New York Trap Rock Corp., West Nyack, N. Y., was recently named chairman of the Accident Prevention Committee of the National Crushed Stone Association by George D. Lott, Jr., president of NCSA.

Consolidated promotes Good and Weintz

WALTER L. GOOD has been promoted to vice president of operations of Consolidated Rock Products Co., Los Angeles, Calif., and Byron P. Weintz, chief engineer, has been named a vice president.

(Continued on page 48)



● Pennsylvania CD Series Reversible Impactor with adjustable upper and lower breaker blocks.

WHY PENNSYLVANIA REVERSIBLE IMPACTORS HELP YOU LOWER YOUR REDUCTION COSTS

The Pennsylvania-pioneered reversible impactor is known throughout the industry for its amazing economy. Here's why.

1. "Free air" impact crushing, with elimination of attrition, means lower reduction costs. Material drops through centrally located feed chute, penetrates deep into path of beaters, is struck, shattered, driven against massive anvils, and is again struck by rotating beaters.

2. Low power requirements, because of large working clearances. There are no cage bars or screens in an impactor. Feeds get through quickly. More product per hour.

3. Push-button reversal. Rotor can be reversed and new sets of hammer faces and breaker blocks are provided on the other side of the mill. No time out or manual hammer turning. Identical product in either direction.

4. Adjustable breaker blocks. As wear occurs, simply move blocks toward hammer circle . . . more constant tonnage, uniform product, more tons crushed per set of hammers.

FREE BULLETIN

Because of the wide range of application, Pennsylvania Reversible Impactors are made in a number of types. For complete description of all types write for Bulletin 6018.

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BATH IRON WORKS CORPORATION
WEST CHESTER, PENNA.

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BATH-BUILT
CRUSHERS

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PEOPLE IN THE NEWS

(Continued from page 46)

Limestone group promotes Miller

ROBERT L. MILLER was named executive secretary of the Iowa Limestone Producers Association, Des Moines, Iowa, at its recent board meeting. Mr. Miller, who has been serving as assistant executive secretary, succeeds the late Clint A. Allen, who died last March.

OBITUARIES

Clare C. Layton, superintendent of the San Bernardino plant of Triangle Rock Products, Inc., San Bernardino, Calif., died August 5 after a long illness. He was 51 years old and had been superintendent of the plant for the past 20 years.

Raymond A. Hoch, chief chemist at the Thomaston, Maine, plant of Dragon Cement Co., division of American-Marietta Co., New York, N.Y., died August 7 after a long illness. He was 55 years of age.

John Fackenthal Magee, chairman of the board of Alpha Portland Cement Co., Easton, Pa., died August 3 after a long illness at the age of 67. He had been associated with the firm for 47 years.

Mr. Magee joined Alpha immediately after graduation from Lafayette College in 1913 and became plant engineer at the Martins Creek plant, where he served for three years. Subsequently he was appointed plant superintendent, then chief engineer of all plants, and later general manager of operations. In 1934 Mr. Magee became vice president in charge of operations, serving in that position until 1944 when he was elected executive vice president. He was named president in 1949, and chairman of the board in 1957.

Leopold Tschirky, retired manager of export sales and sales to the cement industry for the Rock Products Industries Div., General Refractories Co., died recently at the age of 68. A leading authority on refractories for the cement industry, Mr. Tschirky was author of numerous technical articles on the subject, one of which ran serially in ROCK PRODUCTS in 1956.

END

Butler pneumatic trailers haul them for less

No matter what dry bulk commodities you handle, you'll make more hauls per day and more profits per haul when you switch to versatile Butler Pneumatic Trailers.

No other trailer can match Butler's exclusive "P-D" system of pneumatic air delivery for efficient unloading of such a wide range of dry flowables. In a Butler trailer, there are no interior belts or liners to wear out. You deliver fast, even on inclined ramps, and still get positive, 100-percent clean-out. Valve adjustments are not at all critical. Regardless of the material, unloading is a simple, near-automatic job. Your customers need no special receiving equipment, for either horizontal or vertical delivery.

Butler's cylindrical shape saves weight, and it's the strongest, safest design yet developed for a pressure vessel. Code and ICC safety factors are incorporated. And only Butler so completely automatically welds all vessel seams and components to eliminate stress and assure highest strength.

Put a team of these unique Butler "P-D" trailers in your fleet and watch them pay you dividends for years to come. We will be glad to advise you if your product can be readily delivered. Simply write to the Butler address nearest you for full details.

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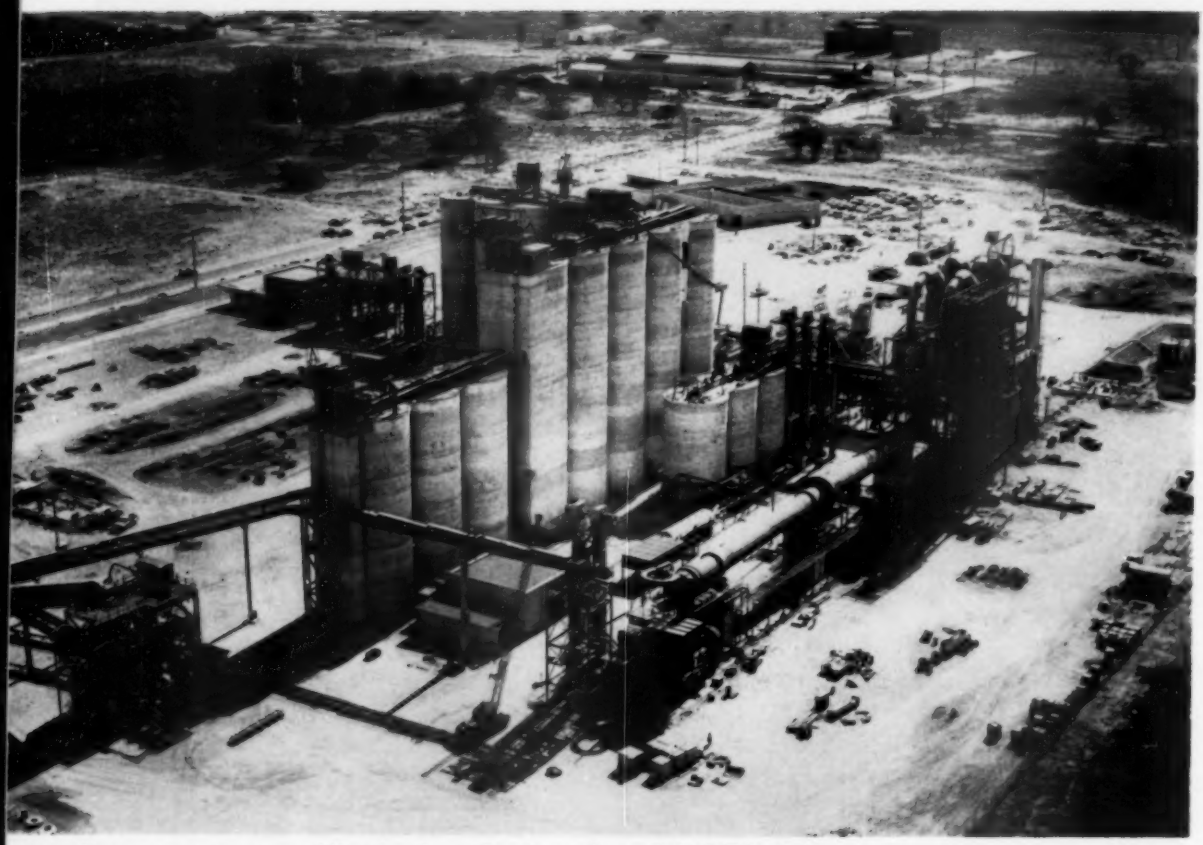

THIS IS A HELICOPTER VIEW of Hawaiian Cement Corp.'s new plant at Barber's Point, Oahu

Two Hawaiian cement plants opened; Alaska next

HAWAII CAME INTO ITS OWN as a cement-producing state when two new plants started up almost simultaneously. Both Hawaiian Cement Corp. and Permanente Cement Co. have dedicated new plant facilities on Oahu. Together, the plants have a capacity of more than 2.5 million bbl. of cement per year. Permanente hardly had put its Hawaiian plant in operation than it announced plans for another cement plant to be built near Anchorage, Alaska.

First, some facts about the Hawaiian plants. The first to start producing was the $12-million plant of Hawaiian Cement Corp. on Barber's Point. Its 240-ft. rotary kiln has a capacity of 1 million bbl. of cement annually. A coral rock quarry nearby supplies limestone for the plant.

Hawaiian Cement Corp. is owned by American Cement Corp. and Cyprus Mines of Los Angeles, Calif., and by these Hawaiian interests: Alexander & Baldwin, Ltd., Hung Wo Ching, B. F. Dillingham Co., Gaspro, Ltd., and Hawaiian Dredging & Construction Co., Ltd.

Permanent's plant at Waianae features a 450-ft. rotary kiln. This $13.5-million facility can turn out 1.7 million bbl. of cement per year. Coral rock needed for cement manufacture is trucked to the plant from its quarry at Maili, a mile away. No blasting is necessary.

The Alaska plant planned by Per-

(Continued on page 53)

FENTON AGAIN TURNS TO EAGLE

for SAND PROCESSING EQUIPMENT

The progressive H. G. Fenton Material Co., San Diego, Calif., is an important West Coast aggregate producer. They have extensive equipment at their various plants and have ample opportunity to evaluate its performance.

They first installed Eagle sand washing equipment in 1957. Recently they installed the Eagle Sand Washing-Classifying-Dehydrating Section shown. It was readily linked up with the existing crushing and screening plant.

The 32′ Eagle Water Scalping-Classifying Tank is equipped with 3-cell Collecting-Blending Flume and easy-operating Metering "Splitter" Gates. It is performing satisfactorily. Final classification and dehydration of the concrete sand is accomplished in a 54″ screw diameter x 32′ long Screw Washer-Classifier-Dehydrator.

Eagle not only designs and builds aggregate processing equipment, but assists in its proper application. As pioneers in the field Eagle is well qualified to give counsel—producers coast-to-coast have learned "the easy way" that they can bank on Eagle's recommendations. *Send us a 10 lb. sample of your material for a free run through our laboratory and a report. Ask for Catalog.*

Factory-Trained Distributors Everywhere

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FINE MATERIAL WASHER-CLASSIFIER-DEHYDRATORS • WATER SCALPING-CLASSIFYING TANKS • COARSE MATERIAL SCREW WASHERS • H.M.S. PLANTS

Where heavyweights move job records prove...
FIRESTONE STAMINA KEEPS PROJECTS ON SCHEDULE!

That sure-fire stamina of cord and rubber in Firestone off-the-highway tires pays off *big*. These dependable tires keep costly equipment on the go and meet tightest schedules. Such exclusives as Firestone Rubber-X—longest-wearing rubber ever built into Firestone tires—and Firestone Shock-Fortified nylon cord—that takes the most gruelling impact punishment in stride—see to that! Another plus: Firestone's Giant Tire Service stands back of every Firestone tire, and a Firestone Tire Expert will match tires to specific project needs and handle your tire maintenance problems. For more worktime and less downtime, see your Firestone Dealer or Store. Or write: Manager, Off-The-Highway Tires, The Firestone Tire & Rubber Co., Akron, Ohio.

ALWAYS SPECIFY FIRESTONE TIRES WHEN ORDERING NEW EQUIPMENT

Super Rock Grip Wide Base* Super Rock Grip Deep Tread*

TUBELESS OR TUBED

Firestone

BETTER RUBBER FROM START TO FINISH

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(Continued from page 50)

manente will be constructed as soon as possible, said Wallace A. Marsh, president. Land has been acquired at Sutton, and the company has filed a mineral claim covering 240 acres of high-grade limestone. A vertical kiln, having 500,000 bbl. of annual capacity, will be installed at the Alaska plant. According to Mr. Marsh, the plant and site are expected to require an expenditure of $5 million.

New book on blasting by Harvard professor

"EFFICIENT BLASTING PROCEDURES automatically minimize vibrations in surrounding ground. For this reason, vibration measurements have been used effectively to assess the efficiency of rock blasting, as well as to monitor the vibrations' capacity for damaging property."

These statements summarize a new book on blasting—L. Don Leet's "Vibrations from Blasting Rock" (Harvard University Press, Cambridge 38, Mass., 134 pp., $4.75). Mr. Leet points out that since vibrations are minimized when explosives have been most efficiently used in breaking rock, thorough study of vibrations provides an indirect measure of blasting efficiency.

Quarry operators, explosives manufacturers, engineers, and contractors will find that this volume brings together previously scattered material on vibrations caused by blasting. The author deals with such basic factors as characteristics of rock, preparation of blasts, events during and after detonation, and the nature of explosives. He describes methods of recording waves in the earth and for estimating their ability to damage structures.

Mr. Leet is professor of geology at Harvard and is the seismologist in charge of the Harvard Seismograph Station.

BPR says 9,100 miles of interstate roads are open

BUREAU OF PUBLIC ROADS announced that more than 9,100 miles of the 41,000-mile interstate highway system are open to traffic. Construction is proceeding on 4,700 miles, and engineering or right-of-way acquisition is underway on another 10,000 miles.

BPR noted that highway construction costs are down—all road work, including projects on the interstate system, cost one-half of one percent less during the second quarter of 1960. This followed a more substantial decline of 2.7 percent reported in the first quarter.

Better Highway Information Bureau's Erskine Stewart, noting the drop in costs, said: "Increased efficiency in the industry is one answer . . . bigger machines, new methods and a climate of intense competition for road work have apparently combined to keep costs in this area down."

Lower expenditures and higher receipts contributed to a better than expected report on the Highway Trust Fund, which finances the interstate program. The Fund entered its fifth year of operation with $110 million more on hand than was anticipated. The reesarch department of National Highway Users Conference gave these preliminary figures for the first four years of the Trust Fund's operation:

Receipts	
Tax sources	$8,408,468,242
Advances from General Fund	359,000,000
Interest on Investments	36,218,560
	$8,803,686,802

Expenditures	
Federal highways	$8,030,061,382
Repayment of advances	359,000,000
Interest payment on advances	5,066,704
Refunds of taxes	290,302,121
Payments to Labor Dept.	268,225
	$8,684,798,432

Minimum wage law applied to rock miners

A FEDERAL COURT OF APPEALS at New Orleans decided that the minimum wage definition of "production of goods for interstate commerce" includes "mining, handling, transporting or in any other manner working on" the materials. The activities of these employes involved mining of rock under a contract between their employer and a construction materials company that owned the quarries. The latter processed the rock and then sold it to contractors engaged in construction involving interstate commerce.

Previously, a lower court decided that employes engaged in mining rock at quarries were too remote with respect to interstate commerce.

This case, Mitchell v. Hooper Equipment Co., was reported in the Labor Case Digest, Vol. II, No. 7, published by the Labor Relations and Legal Dept. of the Chamber of Commerce of the U.S.A.

(Continued on page 55)

SYNTRON cost-cutting equipment of proven dependable Quality

for efficient high capacity screening

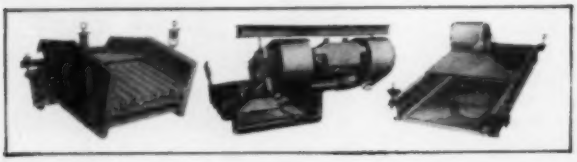
SYNTRON VIBRATING SCREENS

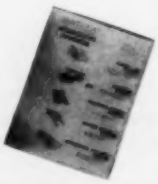
SYNTRON builds a vibrating screen for almost every screening need.

SYNTRON Vibrating Screens have been tested and proven in many sand and aggregate processing applications—sizing, dewatering, media recovery, wet and dry sizing and fine screening. Uniform quality control screening means consistently high quality products.

SYNTRON Screens offer efficiency, dependability and low maintenance for better screening, higher capacity at lower cost.

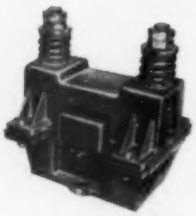
Other SYNTRON Vibrating Screens





Write for the catalog section on Vibrating Screens.

Other SYNTRON Equipment of proven dependable Quality



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VIBRATORY PACKERS

SYNTRON COMPANY

450 Lexington Ave. Quality Equipment Since 1912 Homer City, Penna.

Sales offices in principal cities in the United States and Canada—Agents in most Foreign countries

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(Continued from page 55)

Book tells all about Ontario limestone industry

DO YOU WANT A LIST of limestone producers in Ontario, grouped in order of tonnages produced? Do you want a breakdown of the uses for Ontario limestone, expressed in tons and valuation, for the years 1950-58? Or do you want information about a specific quarry and a chemical analysis of its stone?

A book that anticipates all those questions and more about Ontario's limestone industry—geological, operational and economic—is D. F. Hewitt's *The Limestone Industry of Ontario*. It has been published by Ontario Department of Mines, Toronto, as Industrial Mineral Circular No. 5.

A comprehensive and detailed study, Mr. Hewitt's treatise covers 177 pages. Maps indicate locations of limestone deposits, and stratigraphic drawings delineate their composition. Photographs of the quarries and mills, as well as numerous tables and charts, supplement the text.

The author devotes much of the book to a discussion of the distribution and characteristics of major limestone formations and Ontario quarry operations. This is the way he approaches an area: Tracing the location of a deposit, he classifies its rock units and formations, then examines quarry operations in detail. He describes the equipment used, tells how the stone is transported to its market and indicates the uses to which it is put.

Specifications and uses of limestone and dolomite are discussed thoroughly. Says Mr. Hewitt, "Although limestone is plentiful for most requirements, the supply of certain grades of stone, such as high-purity calcium limestone for the chemical industry, is limited; it must be emphasized that this type of limestone is a wasting asset and should be regarded as such . . . . In the search for stone the need has increased greatly for a knowledge of practical stratigraphy, sedimentation, and . . . structural geology."

NSGA conducts study on gravel

NATIONAL SAND AND GRAVEL ASSOCIATION has invited members to participate in its investigation of effect of maximum size of coarse aggregates on strength of concrete. Participation requires shipment to the Association's research laboratory of about 1,000 lb. of gravel sieved into specified sizes. The purpose of the present study is to determine whether preliminary findings apply to aggregates from different sources.

Stanton Walker, director of engineering, wrote, "It is my opinion that this development with respect to the effect of maximum size is of tremendous importance to the industry. The advantages to the producer who does not have the larger sizes is self-evident. In the case of the producer with the larger sizes, it seems to me that their availability for crushing helps to expand opportunities for marketing in the field of bituminous concrete and stabilized base construction."

Tests of two sizes of gravel will be made, one graded from No. 4 up to ¾-in., and the other from No. 4 up to 1½ in. Each size will be tested for compressive and flexural strength at 28 days, with two cement factors, 5 and 7 sacks per cu. yd. of concrete. In addition to the strength tests, determinations of specific gravity, absorption, unit weight and Los Angeles abrasion loss will be made.

What's coming in November

Bestwall Gypsum is not big as gypsum producers go, but it ranks at the top for sheer energy and ambition to become a major factor in the industry. Its new plant at Brunswick, Ga., is a showplace as well as an efficient producer of gypsum products for new markets

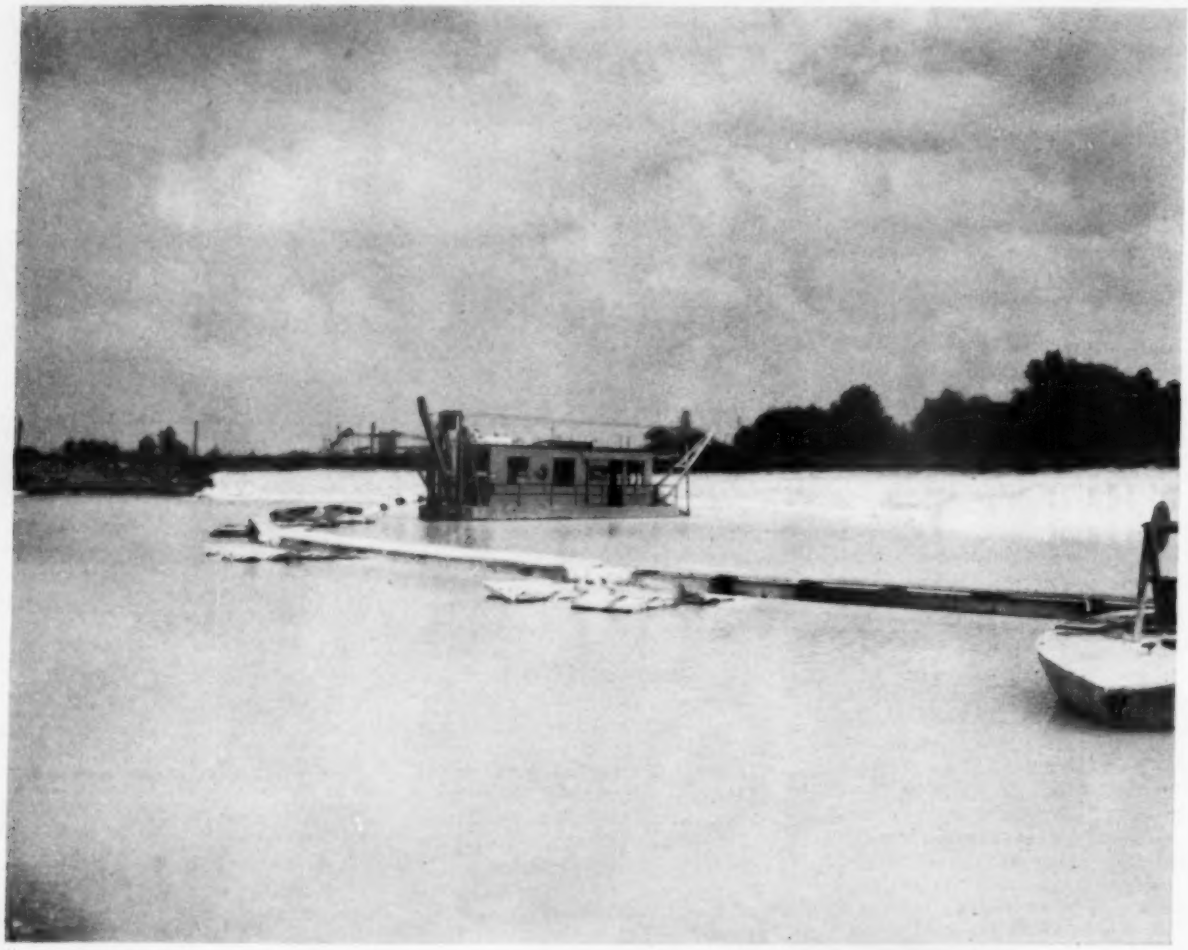
Huron adds seventh ship to its fleet

HURON PORTLAND CEMENT CO., Detroit, Mich., bought the Steamer Amoco from American Oil Co., bringing the number of boats in its fleet to seven. The steamer will be renamed the H. R. Schemm, in honor of Huron's president.

Engaged since 1936 in oil shipping in the Atlantic Ocean and Gulf of Mexico, the Amoco will undergo extensive revisions before its entrance into Huron's service, probably in 1963. Her carrying capacity, when loaded to 23 ft., will be approximately 53,000 bbl. of cement. Its dimensions are 500 ft. long, with 68-ft. beam and 37-ft. depth.

(Continued on page 57)

Dayton, Ohio, Salvages Sludge



...with Armco Dredge Pipe

New steels are born at Armco

For the past 7 years, the Dayton, Ohio, water softening plant has been dumping its calcium carbonate sludge into a nearby pit. When a new highway project was planned directly across this site, the city decided to remove the sludge from the pit and process it in their new $1.5 million recalcination plant. Armco Special Analysis Dredge Pipe was selected for the dredging operation. The resulting product, calcium oxide, is used by Dayton and sold to six other Ohio cities for use in water treatment plants.

The city used 500 feet of 8-inch inside diameter Armco Pipe in 40-foot lengths.

Armco Special Analysis Steel Pipe is made of special steel developed by Armco to withstand extremely abrasive service. For information about how this pipe can serve *you*, write for our illustrated folder. Armco Drainage & Metal Products, Inc., 7040 Curtis Street, Middletown, Ohio.

ARMCO DRAINAGE & METAL PRODUCTS

Subsidiary of ARMCO STEEL CORPORATION

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(Continued from page 55)

National Gypsum Co. acquires Allentown Portland Cement Co.

IN ONE OF THE BIGGEST EXPANSION moves in its history, National Gypsum Co., Buffalo, N.Y., acquired the Allentown Portland Cement Co. of Allentown, Pa. The acquisition involves an exchange of Allentown stock for National Gypsum stock now valued at about $31 million.

Sand screening, settling booklets are available

TWO BOOKLETS on sand preparation that were originally published as a service to ROCK PRODUCTS readers are still available and may be had by writing this magazine. Nathan C. Rockwood's "Screening Fine Materials," copyrighted in 1946, is an authoritative discussion of determining factors in the operating efficiency of vibrating screens.

Another volume, "Fundamental Principles of Sand Settling," (copyright 1929 and 1943) was written by the late Edmund Shaw as a practical guide to commercial sand producers. A limited number of these standard references still on hand will be given to individuals requesting them.

How to avoid blast disaster

THE BUREAU OF MINES, in its new publication, "Tentative Safety Recommendations for Field-Mixed Ammonium Nitrate Blasting Agents," stresses complete segregation of these two classes of material. The combination is so volatile that storage near an explosive is sometimes sufficient to cause detonation. What's more, accidental contact between the fuel and nitrate components can result in fire. Although ammonium nitrate is the least sensitive of all substances capable of explosion, it is an oxidizing material and thus subject to combustion.

Many grades of ammonium nitrate are supplied for field mixing, each with a different degree of sensitivity. A bewildering assortment of blasting agents turns prescriptions for safety into a major problem. Hence, it is important to differentiate between ammonium nitrate as such and ammonium nitrate with fuel-sensitizing agents to make practical recommendations.

The Bureau's recommendations are mainly concerned with the prevention of fire, since this is a major hazard in handling and storing blasting agents, explosives or nitrates. A nitrate fire, for instance, cannot be smothered or chemically extinguished. It can be controlled by water in a small, isolated area. But in the event of a massive blaze—whether explosives are present or not—detonation should be anticipated and the zone evacuated.

Among 61 measures for safety outlined in the report, the Bureau emphasized routine testing of field-mixed compounds with a commercial No. 8 blasting cap. A cap-sensitive mixture will leave a crater in the ground; a non-cap-sensitive one will not. Other precautions resulting from their study of industry practices include the importance of structures for storage. These should be free-standing, uncluttered and of noncombustible materials. Danger areas should be posted and smoking prohibited.

Recommendations are not inflexible. It is the contention of the Bureau, however, that separate transportation is preferable to mixed loads and that field-mixed blasting agents should be excluded from underground mines that are not equipped for maintaining adequate ventilation.

Stock sale enables Maule to expand

MAULE INDUSTRIES, INC., sold 256,278 shares of its common stock to Ponce Products, Inc., for $1,922,087, company officials said. The money will be used to develop a new rock crushing, aggregate producing and concrete manufacturing plant west of Miami. Ponce Products is owned by Jose, Luis and Herman Ferre and the estate of a fourth brother, Carlos Ferre.

Permanente to build another cement depot

PERMANENTE CEMENT CO., Oakland, Calif., increases its string of distribution plants to 11 with erection of a bulk cement depot at Eureka, Calif. Located in the northwest corner of the state, the plant will have a storage capacity of 3,000 bbl. of cement. Bulk cement will be delivered to the plant by Southern Pacific railroad. The geographical area to be served will extend from Garberville north into Oregon and as far east as Willow Creek.

(Continued on page 58)

(Continued from page 57)

Crushed stone plants set safety records

THE BUREAU OF MINES reports that 59 of the 134 participants in the 1959 safety contest sponsored by National Crushed Stone Association operated without a disabling work injury. This was the largest number of winners of the Association's safety plaque since the contest began in 1926.

The contest was divided into five groups, based on man-hours worked—I, 200,001 or more; II, 100,001 to 200,000; III, 50,001 to 100,000; IV, 30,001 to 50,000, and V, 30,000 or less. Winners in each group were the plants with the highest number of man-hours worked.

Here are the winners: Group I—Port Inland Quarry, Gulliver, Mich., Inland Lime and Stone Co., Div. of Inland Steel Co., 451,317 man-hours.

Group II—Dan Quarry, Martinez, Ga., Superior Stone Co., 177,333 man-hours.

Group III—McLeansville Quarry, McLeansville, N.C., Superior Stone Co., 99,900 man-hours.

Group IV—Knoxville City Quarry, Knoxville, Tenn., Vulcan Materials Co., Lambert Brothers Div., 46,621 man-hours.

Group V—Franklin Mine, Franklin, Tenn., Vulcan Materials Co., Lambert Brothers Div., 28,736 man-hours.

Of the operations enrolled in the 1959 NCSA safety contest, 117 were open quarries and 17 were underground mines. Injury rates for the open quarries were decidedly lower than in 1958 . . . 44 percent lower for injury-severity rate and 12 percent for injury-frequency rate.

Injury experience at underground mines also was more favorable during 1959 than 1958. Severity rate was about half that of 1958, and the frequency rate was 29 percent lower.

(Continued on page 62)

What's coming in November

There's a newcomer in the small, select circle of lightweight aggregates. Saturnalite, made in British Columbia, joins the group formed by Idealite, Materialite, Basalite and Rocklite. The November issue tells about this new product, now coming on the west coast market

Nothing... but nothing... stops a Rex distributor

The motto for the U.S. Postal Service is just the beginning for a Rex Distributor. Severe climatic conditions... impossible delivery requirements... unusual product application assistance... nothing stops these couriers from the successful completion of their self-appointed responsibility: providing the best in customer service.

Oh, incidentally, they handle only the best: Rex Quality Drive and Conveyor Chains, Sprockets, Flexible Couplings, Belt Idlers, Pulleys... Shafer Roller Bearings. Need his name? Write CHAIN Belt Company, 4649 W. Greenfield Ave., Milwaukee 1, Wis. CHAIN Belt (Canada) Ltd., 1181 Sheppard Ave. East, Toronto.

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CHAIN BELT COMPANY

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FOR PROFITABLE RESULTS WITHOUT COMPLAINTS

WHICH

READY TO SHOOT — Montgomeryville Stone Company near Philadelphia, Pennsylvania.

⅓ SEC.—There is no sharp report; only the efficient "thud" of explosives at work.

Noise, vibration and flying rock can be a serious threat to your local public relations. New explosives, blasting agents and blasting supplies, combined with recently developed blasting techniques, are helping many operators to overcome these old, troublesome problems.

With modern seismograph equipment, vibration has become relatively easy to cope with. Noise and throw, on the other hand, are directly related to blasting control. Techniques such as prolonged confinement of explosive gases, electrical initiation at the point of maximum confinement, and proper use of stemming have greatly reduced air "snap." When you carefully calculate spacing and burden, and correctly load the right explosives, the explosive force exerts its full power in *breaking* rock—not flinging it wildly through the air.

And the same factors that reduce noise, vibration and throw also are responsible for better breakage and lower costs.

Your Atlas Representative, backed by the complete Atlas line (including all types of ammonium nitrate), can help you select the best combination of explosives or blasting agents and the right blasting techniques to give you maximum control on every shot. And remember, blasting control means greater profits.

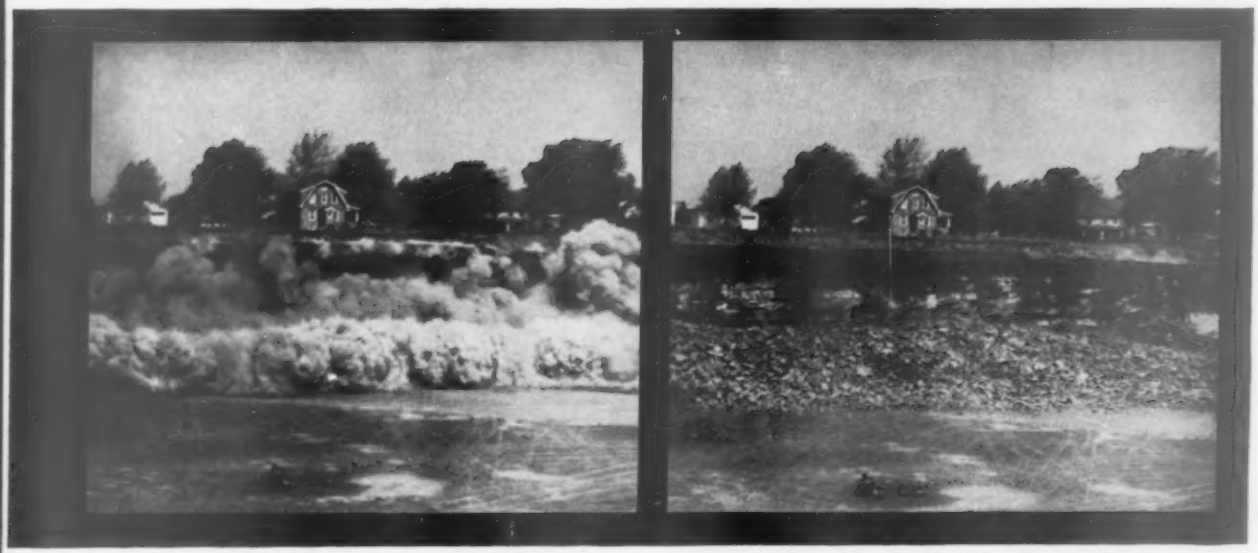
Our blasting cost chart, slide rules and technical literature are designed to help you achieve maximum control and determine your lowest true blasting costs. Ask your Atlas Representative about them—or write directly to:

ATLAS POWDER COMPANY
Explosives Division, Wilmington 99, Delaware

ROCKMASTER® electric blasting caps achieve the staggered action which is so important in producing better breakage and control.

FROM NEIGHBORS...

EXPLOSIVE?



1⅛ SEC. — Solid explosives action without excessive noise, vibration, or flying rock.

AFTER—There is plenty of easy digging in this pile. Explosive was Amocore.®

AMOCORE is a mixture of AN and carbonaceous material, packed with a gelatin core. Insures propagation of any length column.

ATLAS PELLETS, a new physical form of ammonium nitrate, have the density and sensitivity required for efficient AN-oil blasting.

GIANT "75" PRIMERS have the wallop for complete, efficient detonation of both field mixed and plant mixed blasting agents.

ATLAS EXPLOSIVES

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INDUSTRY NEWS

(Continued from page 58)

Master Builders opens new research, technical center

THIS IS the petrographic laboratory in Master Builders Co.'s new research and technical center in Cleveland, Ohio. Here, microscopic studies of concrete, aggregate, sand and cement are conducted as part of the company's extensive research program.

The center is dedicated to research and development of products to improve concrete and supplemental research on concrete and all concrete ingredients. In the concrete laboratory, investigations are conducted on admixture formulations, cement, aggregates and mix proportions. A total of 90,000 lb. of coarse aggregate and sand can be stored in three separate bins that are loaded from outside the building. Bagged cement is stored in a special storage room.

The research and technical center occupies 16,000 sq. ft. of space in Master Builders' new headquarters building in Cleveland.

Gypsum exploration rights granted for Ontario area

AN EXPLORATORY LICENSE from Ontario's Minister of Mines gives Moosonee Gypsum Exploration Co. Ltd. exclusive rights for three years to explore and develop deposits of gypsum, anhydrite and calcium sulphate. Area covered by the license is about 384 sq. mi. in the James Bay Lowlands.

During this three-year exploration period, the company is bound to spend a minimum of $65,000 on drilling and other exploratory work and pay an annual fee of $2,000.

Should commercial deposits be found, the company has the option to lease a maximum of 10,000 acres in a single block. A plant must be constructed within two years of granting of the lease and production must begin within three years.

(Continued on page 65)

Utilizes Westinghouse "failure-free" diodes

25% MORE EFFICIENT

buell Norblo®

You get more power...reduce maintenance...increase reliability when you convert to Buell Silicon Rectifier Units

Buell Silicon Rectifier units can increase efficiency of your rectifiers 25% or more ■ Perfected and specifically designed for fast, simplified conversion of existing mechanical or tube rectifiers ■ They cut operating costs, reduce overall maintenance ■ Enable more efficient utilization of power ■ Eliminate rectifier maintenance ■ Reduce outages ■ Reclaim plant space ■ Suitable for indoor or outdoor installation ■ For only a small investment you can materially improve your rectifier performance ■ For details of the unit and a specific proposal write: Buell Engineering Co., Dept. 17-J, 123 William Street, New York 38 ■ Northern Blower Division, 6408 Barberton Ave., Cleveland, Ohio ■ CYCLONES, ELECTRIC PRECIPITATORS, BAG COLLECTORS, COMBINATION SYSTEMS, CLASSIFIERS, FANS.

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DISTRIBUTOR DAN, the SKF bearing man, offers

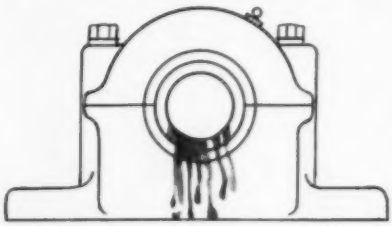
FIVE TIPS ON BEARING LUBRICATION

—that can save time and trouble for you

WHEN TO RE-LUBRICATE? Always follow the manufacturer's directions, if they're available. Most bearings, whether oil- or grease-lubricated, need cleaning and re-lubrication once a year. Re-lubricate oftener if the bearing is large, operates at high speeds or temperatures of 120-140 F. or higher.

WHAT GREASE CAN TELL YOU. Grease itself can tell you when cleaning and re-lubrication are needed. Dark grease means that oxidation has started or that abraded particles are present. Changes in the original color indicate water. Grease of a hard consistency should always be replaced.

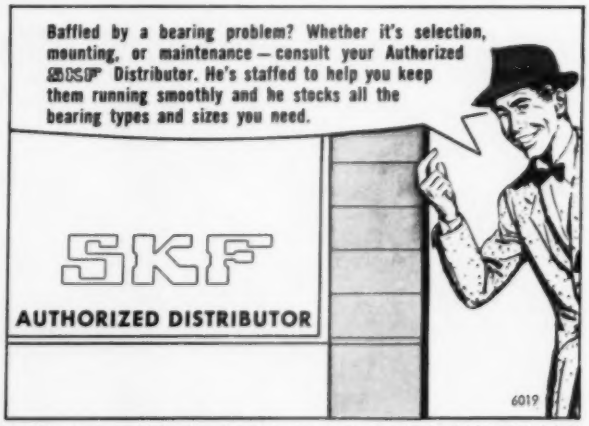
WHEN TO CHANGE OIL. Compare the oil in the bearing with unused oil. Clouded oil indicates water. Dark oil frequently indicates sediment. Dark, pitch-like coatings on the rings, roller ends or cage mean the oil has become dirty or begun to carbonize. So, clean the bearing and housing and re-lubricate.



TOO MUCH IS WORSE THAN TOO LITTLE. Don't overlubricate. Only grease that actually contacts the bearing lubricates. Using too much grease may cause churning and lead to overheating and loss of lubricant. Remember: the higher the speed, the more sensitive a bearing becomes to excessive lubrication.

CLEANLINESS, FIRST AND LAST. Clean new oils and greases will usually force-out old lubricants in the bearings. But they won't if the lubricant is badly oxidized. Pour a hot aqueous emulsion into the housing. Rotate shaft until bearing is clean. Drain solution while rotating shaft. Then, flush with hot light oil, drain and add new lubricant.

Baffled by a bearing problem? Whether it's selection, mounting, or maintenance — consult your Authorized SKF Distributor. He's staffed to help you keep them running smoothly and he stocks all the bearing types and sizes you need.



Spherical, Cylindrical, Ball, "Tyson" Tapered and REED Miniature Bearings

EVERY TYPE—EVERY USE

SKF®

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

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(Continued from page 62)

Pavement yardage

AWARDS OF CONCRETE PAVEMENT for the month of July and the first seven months of 1960 have been classified by Portland Cement Association as follows:

	Sq. yd. awarded during: July	1st 7 mos.
Roads	5,230,043	37,125,894
Streets and alleys	3,881,155	18,985,460
Airports	1,525,759	5,160,184
Totals	10,636,957	61,271,538

What's ahead for National Gypsum?

ALTHOUGH THE NEW BOOKLET, "Design for Growth," is essentially a history of National Gypsum Co., it presents a teasing glimpse of the future. Issued on the occasion of the company's 35th anniversary, it lets the reader in on a few milestones National expects to reach. Among them:

- "National's researchers are up to their necks in the development of a totally new type of house that's in the works down the road a bit. It won't have any wood framing, no studding.
- "Then there's another project in which National has a hand that gives promise of a home without a furnace for the coldest climates.
- "Expect, too, breathtaking advances in plastics for the construction industry.
- "Ten years hence the construction industry will be a third to a half larger than it is today."

The company expects annual sales to more than double in the next decade. By 1970, sales of the building materials company will be about $500 million, according to present estimates. The company plans to invest at least $275 million in new and expanded facilities between now and 1970.

Since its beginning in 1925, National Gypsum has expanded and diversified until it has assets of more than a quarter-billion dollars and markets 11 major lines, including gypsum, lime, mineral wool, asbestos, and portland cement.

NLI has new office

NATIONAL LIMESTONE INSTITUTE INC. has notified members that headquarters have been moved. The new address is 210 H. Street, N.W., Washington, D.C.

(Continued on page 66)

(Continued from page 65)

New silica sand plant near Valley, Wash.

LANE MOUNTAIN SILICA CO. is building a $500,000 silica sand beneficiation plant near Valley, Wash. Facilities are included for crushing pit run material, milling, attritioning, flotation, filtering and drying. The plant is expected to be in operation late this fall.

Two companies own about 70 percent of the stock of Lane Mountain Silica—Northwestern Glass Co., Seattle, Wash., and Del Monte Properties Co., Pebble Beach, Calif. The plant will be under the supervision of Del Monte Properties Co., with Charles Smith of Valley, Wash., as superintendent. Hugh Bein is in charge of construction.

Officers of Lane Mountain Silica, a Washington corporation, are Richard Osborne, president; Hugh H. Bein, vice president; Stanley P. Jones, secretary, and Murray Mathews, treasurer.

India's cement industry made significant gains

SIGNIFICANT PROGRESS has been made by the cement industry in India during the past few years. Now comprising 36 plants with annual capacity of 8.98 million tons, the industry will have a 13.7-million-ton capacity by 1961 when new plants are completed. The following table gives manufacturing capacity and production of cement in India for the years 1955 through 1959:

	Million long tons	
	Capacity	Production
1955	4.743	4.488
1956	5.703	4.928
1957	6.534	5.606
1958	7.959	6.068
1959	8.980	6.777

Marquette buys plant site

MARQUETTE CEMENT MFG. CO. bought a 15-acre site in Chicago at 100th St. and the Calumet River. It will first be used for a distributing plant for cement from Marquette's Oglesoy plant. When demand warrants, a new cement plant will be built there. W. A. Wecker, Marquette's president, said no time has been set for building of the cement producing plant, but preliminary designs have been completed for facilities totaling 2¼ million bbl. of annual capacity.

(Continued on page 71)

IN FLORIDA, LEHIGH PORTLAND ZEROS IN ON ELECTRICAL SYSTEM RELIABILITY, SAFETY, LOW MAINTENANCE

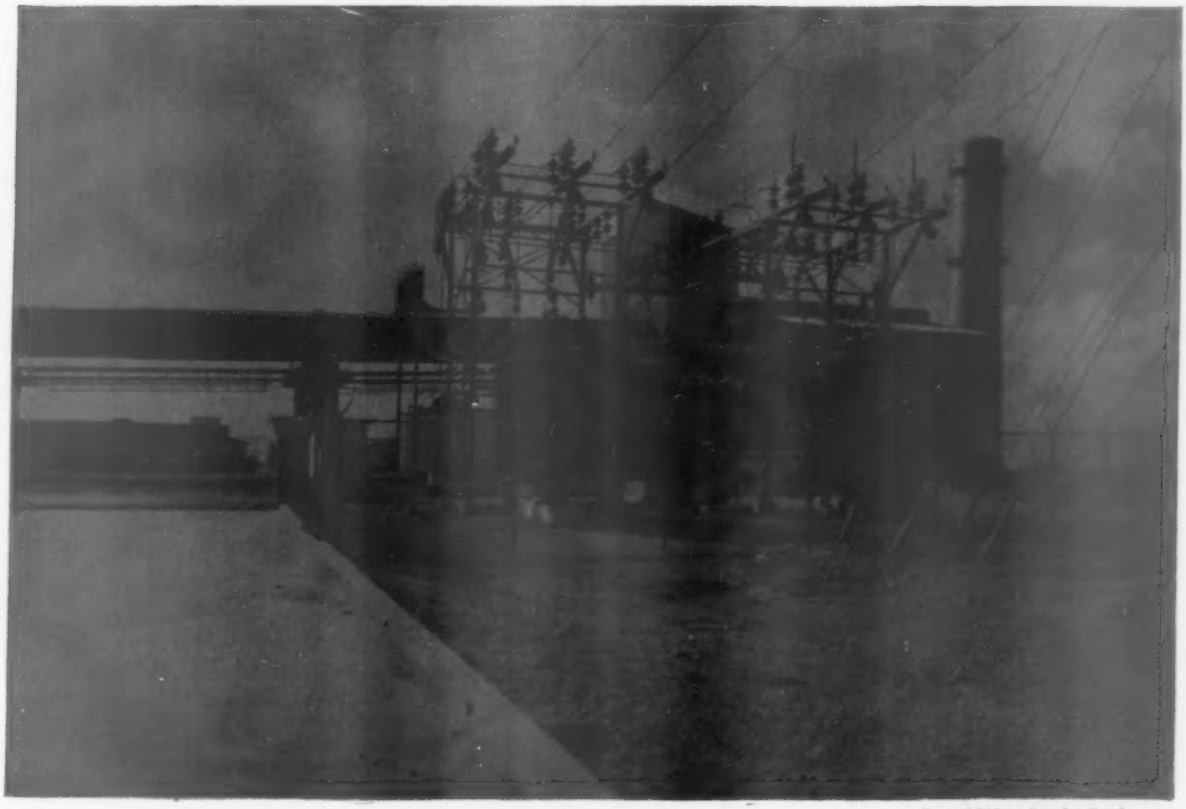
ZEROS IN

When the Lehigh Portland Cement Company built its new plant about five miles west of the Miami city limits, prime considerations for the plant's electrical system were maximum reliability, personnel safety and low maintenance. Careful planning and selection of Westinghouse equipment scored a bull's-eye. For details on how Lehigh Portland achieved these objectives . . . turn the page.

Westinghouse

POWER FOR PRODUCTION at Lehigh Portland's new Miami plant is supplied by this main 15,000-kva double-ended substation located outdoors. It is double-ended for easier maintenance without a power outage, and located on the windward side for less flashover. This design gives greater flexibility and reliability. Some advantages are periodic insulator and bushing cleaning, no load tap changing, reduced capacity operation . . . all without a power outage. Like most electrical equipment in the plant, substation has provision for extra capacity, will accommodate 18,750 kva.

J-96149-1

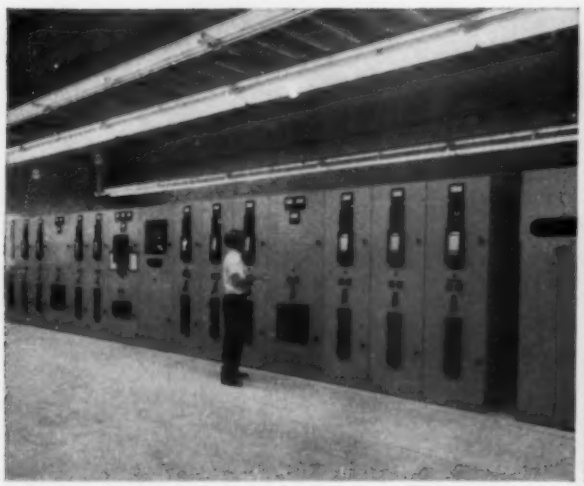


Enter 1500 on Reader Card

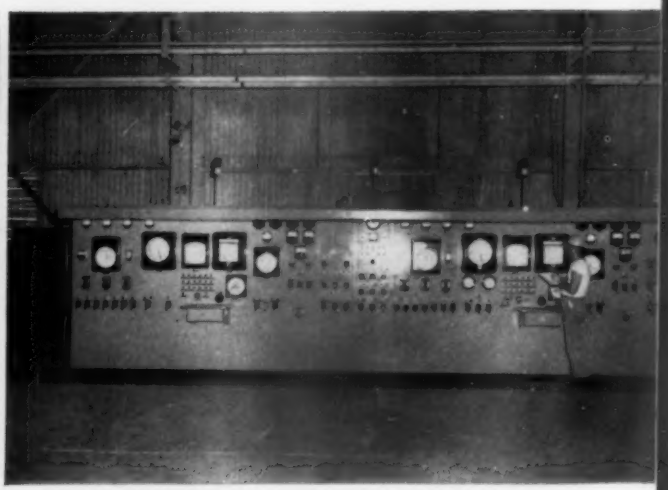
HERE'S HOW LEHIGH PORTLAND HIT

SYNCHRONOUS, COUPLED-TYPE MOTORS driving the Lehigh plant ball mill help assure top production. Thermalastic® insulation, with neoprene coating, offers a dimensionally stable, resilient insulation unaffected by wet and abrasive atmospheres. Saturable reactor control eases the motor into the gear train to bring the mills up to speed.

J-96149-2



SIMPLICITY, RELIABILITY, LOW COST are big benefits of plant's radial distribution system using metal-clad switchgear with protective Type DH drawout air circuit breakers. Switchgear permits independent operation of plant departments, facilitates metering. Indoor switchgear is used in this plant.



CONTINUOUS CHECK on performance is maintained with Westinghouse recording and indicating instruments on many phases of plant's automatic operation. These sensitive instruments keep production records accurate and help plant personnel hold production at maximum output without overloading the equipment.

ELECTRICAL GOALS WITH WESTINGHOUSE

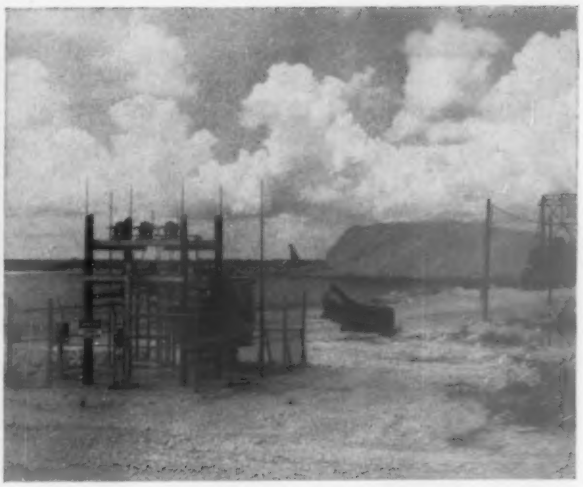
At its Miami site, Lehigh Portland Cement Company has built a highly modern plant to effect economies in cement production. Helping to bring about these economies are the reliability, safety and low maintenance of the plant's electrical system. Here are some of the ways in which Westinghouse planning and equipment achieved these system goals:

- All equipment was selected to provide adequate, uninterrupted service for today, yet provide for easy, economical expansion to meet future demands.
- Westinghouse indicating and recording instruments are used in the plant for on-the-spot checks of processes.
- The Everglades site is located in a humid area and was under water most of the year. Even when the plant grade was raised, water seepage could cause damage to the underground electrical system. The design of Westinghouse equipment, special watertight manholes and rigid steel duct encased in concrete overcame this difficult problem.
- A simple, radial system distributes power from the main substation to the plant's operating departments. Small, low-cost power centers located at load concentrations achieve lower voltage drop, less power loss, more flexibility and greater reliability.
- Maximum protection for personnel and equipment at the quarry is provided by special system grounding precautions.
- The outdoor substation proved more economical than one indoors or under a roof.
- Distribution voltage for the plant is 4160 volts, making possible savings in initial cost.
- Voltage drop during starting of the 1250-hp ball mill motors—the most severe system requirement—is estimated to be only 5.6%, which minimizes the malfunctioning of this and other electrical equipment.

Westinghouse

J-96149-3

OPERATING RELIABILITY is possible with small, economical indoor Inerteen® Power Centers installed in clean, pressurized rooms. Location at load concentrations minimizes voltage drop and losses.



MAXIMUM PROTECTION is afforded personnel and equipment in the rock quarry by use of safety-resistance grounded systems. Portable switch houses immediately isolate faulted cable and equipment.

Enter 1500 on Reader Card

HOW LEHIGH PORTLAND HIT ITS GOALS (*continued*)

The down-the-line planning and careful coordination of equipment that went into the Lehigh Miami plant are basic to the Westinghouse approach to electrical equipment for top cement production. For more information, call your nearby Westinghouse representative today . . . or write Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa. You can be sure . . . if it's Westinghouse. J-96149-4

Westinghouse

RELIABLE, FINE CONTROL is provided by Westinghouse equipment for this overhead traveling crane using an adjustable voltage, direct-current bucket drive. Westinghouse control helps keep raw materials flowing through the plant smoothly.

AUXILIARY POWER generated by a 438-kva, 0.8 p-f diesel generator. This unit can tie in to supply critical loads, such as air compressors and lighting, subsequent to a power failure.

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(Continued from page 66)

Treasury seeks opinions about depreciation

THE UNITED STATES TREASURY DEPT. has started a survey of 6,000 firms to obtain information on their current practices and opinions on depreciation allowance for income tax purposes. Commenting on this action, National Crushed Stone Association advised members who receive questionnaires to answer them and to provide the essential information.

The Treasury needs adequate statistical information for proper evaluation of proposals it has received for changes in the tax laws. The information will enable it to determine how the present depreciation provisions are operating and what legislative changes may be appropriate.

Concerning answers to that part of the survey dealing with producers' opinions on proposed depreciation legislation, NCSA told members that it has taken no official position. For that reason, the Association suggested that each operator state his own preference with respect to liberalized depreciation methods.

PCA gets safety award

PORTLAND CEMENT ASSOCIATION was cited by National Safety Council for reducing the disabling injury frequency rate in quarry operations 16.75 percent in the last five years. It is one of 10 associations receiving NSC's safety awards for 1960.

NSC commended PCA for surveying members' safety activities, collecting and analyzing accident statistics, publishing injury rates, conducting a training course for supervisors and a safety contest, and providing materials and consultation to the association members.

Install new conveyors

KAISER ALUMINUM & CHEMICALS Co.'s demand for white dolomite roofing material made it necessary to install two new conveyors at the company's dolomite operation at Natividad, Calif. One, 300 ft. long, stockpiles roofing dolomite. The other is a transverse conveyor, housed in a steel pipe under the refractory material stockpile.

(Continued on page 72)

(Continued from page 71)

Cuba seizes properties of Lone Star Cement

CUBAN PROPERTIES of Lone Star Cement Corp., valued at about $25 million, were taken over by the Cuban government. Included were production facilities and shipping terminals of Cuban Portland Cement Co., Lone Star's main operation on the island. "Whether they call it intervention or appropriation, they've seized the company," said H. A. Sawyer, chairman and president of Lone Star. Having taken over two local cement companies earlier, the Cuban government now has complete control of the island's cement industry, he said.

Record year seen for construction in Canada

THE BUREAU OF STATISTICS, Ottawa, Ont., forecasts a record construction program for Canada in 1960. Total expenditures are estimated at $7.3 billion, an increase of 2.6 percent from 1959's previous record. The increase compares with increases of .5 percent in 1959, 1 percent in 1958 and 8.8 percent in 1957.

Main impetus is expected to come from non-residential building construction, especially commercial and institutional building. Housing starts are estimated to fall 10 to 15 percent below the 141,000 starts of 1959, with value down 4 percent.

Idaho notes mining shift from metals to nonmetals

"PROBABLY THE MOST SIGNIFICANT development in Idaho mining during 1959" is a shift in emphasis from the mining of metals to nonmetals, according to George D. Fletcher, state mine inspector.

Three plants were cited as examples of the expanding nonmetallic mining industry: Central Farmers Fertilizer Co.'s phosphate mine at Georgetown, Anaconda Co.'s phosphate mine at Soda Springs and Simplot Co.'s clay and silica sand operation at Bovill.

Idaho's mining industry, said Mr. Fletcher, is optimistic for continued improvement. Part of the optimism is based on the increased emphasis on the nonmetals, which one expert said, "will never drop off like metals."

(Continued on page 74)

ALLIS-CHALMERS

How to increase screen tonnage without working around the clock

Every change in tonnage or specifications throws an extra load on screens. In fact, a good portion of the problems you face — cutting down on waste, lowering production and maintenance costs, taking on a new contract—either directly or indirectly involve screens.

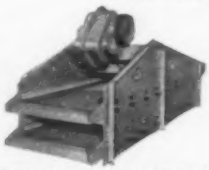
Fortunately, you don't have to face these problems alone. Allis-Chalmers engineers have been solving screen problems like yours for years, and coming up with the right screen, properly engineered to fit the specific application.

Whether you're replacing obsolete equipment, looking for a more efficient way to handle scalping, sizing, washing or rinsing operations, or building an entirely new plant, A-C engineering experience is ready to go to work for you, too.

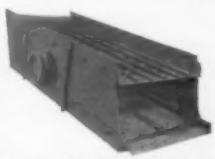
Let A-C engineers tackle your screening problems. Simply send them to us and Allis-Chalmers will submit an engineered recommendation on the most economical screen for your particular job. **Allis-Chalmers,** *Industrial Equipment Division, Milwaukee 1, Wis.*

Aero-Vibe, Low-Head, Ripl-Flo and ROM are Allis-Chalmers *trademarks.* A-1354

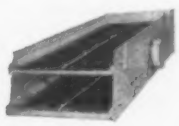
AVS **Aero-Vibe** inclined screen for economical sizing, up to 1½ inches, wet or dry.



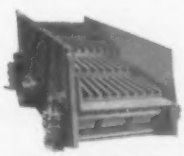
Low-Head horizontal screen for efficient coarse to fine sizing (wet or dry), rinsing, washing, dewatering, media recovery.



XH **Ripl-Flo** inclined screen for cost-saving scalping and coarse sizing, wet or dry.



SH **Ripl-Flo** inclined screen for light scalping, coarse or fine sizing (wet or dry), rinsing or washing.



XXH **ROM** inclined screen, a brute for tough primary scalping jobs and high tonnage.

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INDUSTRY NEWS

(Continued from page 72)

Sand and gravel safety winners named

THE BUREAU OF MINES has announced winners of its sand and gravel safety competition for 1959. In the group of bank or pit plants, winner was the Lockport plant, Material Service Corp., Lockport, Ill., which operated 204,081 man-hours without a disabling work injury. It has taken top honors in its group for five consecutive years.

In the group of dredge plants, winner was the Bluff Creek plant of Jahncke Service, Inc., Bluff Creek, La. It achieved a record of 139,021 man-hours free of disabling injury. It took top honors three times in the last 10 years, plus three honorable mentions.

A total of 142 bank and pit plants enrolled in the competition. They worked an aggregate of 7,386,585 man-hours in 1959, with 151 injuries. There was one fatality, one permanent partial injury and 149 temporary total injuries. The number of days lost from injuries was 9,712. The frequency rate for these injuries was 20.442 per million man-hours of exposure; severity rate was 1,314.8 days lost per million man-hours, a 38-percent decrease from the 1958 severity rate.

The 31 participating plants in the dredge group worked 1,856,916 man-hours in 1959. They reported 44 work injuries, of which 2 were permanent partial disabilities and 42 were of temporary total nature. Time lost: 1,672 days. Frequency rate was 23.695 and severity rate was 900.4 per million man-hours of exposure. Both rates were above 1958 figures.

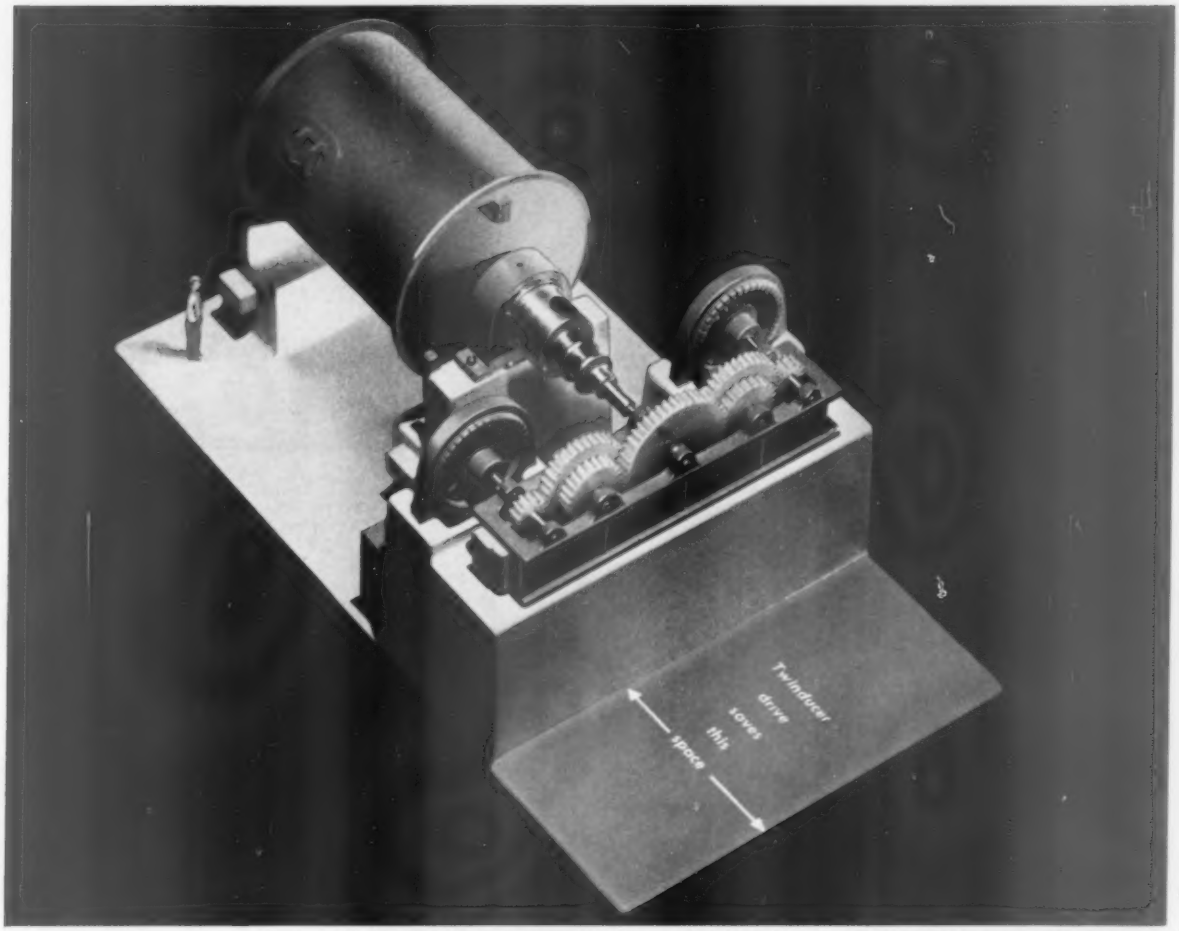
In all, the Bureau of Mines presented certificates of achievement in safety to 65 of the 173 plants that participated in the competition. Each winner of this award operated 20,000 or more man-hours in 1959 without a disabling work injury.

Illinois fluorspar subject of brochure

ILLINOIS STATE GEOLOGICAL SURVEY, Urbana, Ill., has prepared a brochure, "Illinois Fluorspar," which deals with the occurrence, mining, uses and economics of the material. Designated Circular 296, it was prepared at the request of the Illinois fluorspar producing industry. Authors of the three-part brochure are J. C. Bradbury, H. E. Risser and G. C. Finger.

END

ALLIS-CHALMERS



A 2000-hp Twinducer drive mill conserves up to 16 feet of space compared to other trunnion drive designs.

Twinducer drive saves on space and wear...

divides mill loads electrically

Another Allis-Chalmers first — *Twinducer* drive mill — creates new space savings, new long-range operating and maintenance economies.

Dynamic electrical load distribution is accomplished through rotor shift of one of the two motors. Once the load is balanced and the rotor locked in place, there is no need for further adjustment. No need for a floating gear or pinion, either, since electrical, not mechanical, balancing is employed with *Twinducer* drive.

Gears and pinions experience less wear because they are fixed. Wear is further reduced because the gear train runs in a filtered oil bath, promoting longer gear life through both splash and flood lubrication.

Twinducer drive efficiently harnesses the power of *two* synchronous motors located on the mill side of the drive. This unique, compact arrangement reduces drive dimensions drastically . . . as much as 16 feet on a 2000-hp drive.

Twinducer drive promotes better housekeeping, too. No lubricant leakage because the system is enclosed. No oversized foundations, no pits to collect waste materials and dirt.

Ask your A-C representative about the outstanding features of Twinducer drive mills. **Allis-Chalmers,** *Industrial Equipment Division, Milwaukee 1, Wis.*

Twinducer is an Allis-Chalmers trademark. A-1365

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CONVEYOR SYSTEM SUPPLIES AGGREGATES TO READY-MIX, BLOCK AND PIPE PLANTS

This efficient, economical 5-unit Barber-Greene belt conveyor system supplies all aggregates to the concrete block pipe and ready-mix operations of Pinellas Industries, Inc., St. Petersburg, Florida.

"Our Barber-Greene conveyors have given us seven years of dependable operation, handling 15,000 tons of aggregate monthly for a total of 1,260,000 tons," reports Terry B. Peacock, vice-president and general manager.

"Maintenance per ton handled has been very low . . . no carrier replacements," he adds.

All conveyors have 24″ belts, total 929′ in length and have a 300 tph capacity.

The several sizes and types of aggregate required arrive in bottom dump rail cars. Stockpiling flow pattern: From cars into track hopper which discharges onto 193′ inclined conveyor leading to reversible shuttle conveyor high above four stockpiles that are kept free of contamination by bulkheads. Shuttle conveyor also charges ready-mix plant directly.

Reclamation of aggregates as needed is by tunnel-housed 295′ conveyor located beneath stockpiles. Hand-operated clamshell gates drop material onto conveyor which discharges onto 285′ inclined conveyor leading to central control turnhead atop batching plant. Use of bypass chute fitted to turnhead assembly permits discharging aggregate onto 63′ conveyor supplying pipe plant.

Get this same lowest-per-ton-cost material handling efficiency for your pit, quarry or concrete products plant by calling your Barber-Greene Conveyor Specialist. His Standardized Conveyors, made of pre-engineered and pre-aligned components, plus Barber-Greene's 40 years of design experience can lower your original investment and your maintenance costs.

Overall view of Pinellas Industries, Inc. three plants, all served by a one-man-operated Barber-Greene conveyor system. Seven year production: 33,600,000 concrete blocks, 103,000 concrete pipe joints ranging from 12-60" inside dia. and 346,400 yards of ready-mix for an all-truck fleet.

Aggregate classification and stockpiling is neatly handled by this 93' reversible Barber-Greene shuttle conveyor above four storage areas. Shuttle also feeds belt conveyor charging new ready-mix plant directly.

Closeup of conveyor that reclaims from stockpiles and charges central control turnhead atop batching plant.

Send for new Idler bulletin

New 44-page Idler Bulletin describes the more than 800 units available in the complete Barber-Greene line, tells how their years-ahead features bring longer life and greater economy to every job. Ask for your copy today.

Your belt conveyor equipment headquarters

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U. S. A.
Plants in DeKalb, Illinois. Detroit. Canada. England. Brazil. Australia

CONVEYORS • LOADERS • DITCHERS

• ASPHALT PAVING EQUIPMENT

CALENDAR

OF COMING EVENTS

1960

October 17-19, 1960—Biannual Symposium on Drilling and Blasting, Colorado School of Mines, Golden, Colo.

October 18-19, 1960—Cement, Quarry & Mineral Aggregates Section, National Safety Congress, Conrad Hilton Hotel, Chicago, Ill.

Oct. 31-Nov. 2, 1960—American Concrete Institute, 13th Regional Meeting, Pioneer Hotel, Tucson, Ariz.

November 3-4, 1960—National Slag Association, Annual Meeting, Hotel Mayflower, Washington, D.C.

1961

January 17-19, 1961—National Limestone Institute Inc., 16th Annual Convention, Statler-Hilton Hotel, Washington, D.C.

January 17-20, 1961—National Crushed Stone Association, Annual Convention, Hotel Americana, Bal Harbour, Fla.

January 23-26, 1961—National Sand & Gravel Association, Annual Convention, Hotel Americana, Bal Harbour, Fla.

Jan. 29-Feb. 3, 1961—American Society for Testing Materials, Committee Week, Netherland Hilton Hotel, Cincinnati, Ohio

February 20-23, 1961—American Concrete Institute, 57th Annual Convention, Chase-Park Plaza Hotels, St. Louis

Feb. 23-Mar. 2, 1961—American Institute of Mining, Metallurgical & Petroleum Engineers, Annual Meeting, Chase Hotel, St. Louis, Mo.

March 5-8, 1961—American Road Builders Association, 59th Annual Convention, Atlantic City, N.J.

April 12-14, 1961—American Institute of Mining, Metallurgical & Petroleum Engineers, International Symposium on Agglomeration, Sheraton Hotel, Philadelphia, Pa.

April 18-20, 1961—American Institute of Electrical Engineers, Cement Industry Technical Conference, The Sheraton-Cadillac, Detroit, Mich.

June 25-30, 1961—American Society for Testing Materials, 64th Annual Meeting, Chalfonte Haddon Hall, Atlantic City, New Jersey.

THERE'S NO EASIER DRILL TO RUN THAN A REICHdrill!

This smooth operating, all-hydraulic rotary rig is helping REICHdrillers set higher footage records.

In blast holing, prospecting and coring, there's no easier drill to run than a REICHdrill. And the key to money making drilling records is a simplified *control "console"*. From it, every move required by the driller . . . every decision he makes . . . is converted smoothly, instantly, by the all-hydraulic system, into positive, time-saving performance.

Hydraulic drive to drill stem eliminates power loss . . . transmission troubles . . . kelly and rotary table.

Vari-speed Hydraulic Drill Control gives the operator the right combination of rotary speed and feed pressure for every formation . . . leveling jacks, mast raising cylinder and barrel loader are hydraulic too!

Other features: fast, easy set-ups; masts incline for angle drilling; CP heavy-duty compressors; CP Air-Blast Bits for extra footage in toughest formations. *You get more from your rotary when it's a* REICH*drill!*

C-650 crawler mounted REICHdrill set-up for angle drilling. Hole size; to 7-7/8"; down-pressure: to 30,000 pounds. Other models available, truck or crawler mounted, with hole sizes to 16", down-pressure to 90,000 pounds.

For further information write:

REICHdrill

1442 BEECH ST., TERRE HAUTE, INDIANA

Division: CHICAGO PNEUMATIC TOOL CO.

Positioned at control "console", REICHdriller has every rig maneuver in sight . . . every rig control in reach.

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HINTS & HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Magnetic sweeper

A SOUTHERN rock products producer who was plagued with punctured truck tires decided to do something about the situation. A 6-ft. wide magnet with a small gasoline engine-operated generator was assembled in a shape that could be carried by a fork lift truck. The magnet can hold nearly 300 lb. of magnetic scrap.

Every morning the fork lift travels up and down the roadways in the plant to gather the previous day's accumulation of nails, bolts, wire and other steel scrap.

Tire maintenance that regularly costs $500 a month has been reduced to practically nothing, and the savings have paid for the cost of the generator and magnet in less than two months.

Concrete structures

STRUCTURAL CONCRETE is slowly coming into its own in the rock products industry. A middle western cement plant uses precast concrete piers to support long belt conveyors, and an inverted U-beam is used as the truss to support the conveyor idlers.

In contrast, a British cement plant constructed its new covered storage building in the form of a large "A." The inclined concrete columns support the crane runway and roof. Since the crane is in the narrow top of the A, its span has been greatly reduced. The structure is topped with precast roof deck slabs.

The walls of the building extend down from the crane runway to within about 10 ft. of the ground. This design permits trucks to drive into the building directly under the bucket so that they can be loaded or unloaded.

Belt conveyors in the same plant are suspended from concrete arches to eliminate structural supports in roadways or storage areas. But a southern rock products producer in this country has solved the same problem with the extensive use of extremely long prestressed concrete T-beams. Conveyor idlers are mounted on the flat top of the T whose ends are supported on concrete A-frames.

Stockpiling techniques

MOST STATES require that stockpiles of aggregates be built up in carefully controlled layers. Apparently this technique prevents segregation of material.

A large number of aggregates producers meet this requirement by bulldozing material into stockpiles, taking aggregates from the conical piles at the ends of storage conveyors. But for one producer this seemed to be a long way around the barn. Instead, he takes production directly from the belt conveyor and loads it into a bottom-dump scraper.

He has two 7-cu. yd. units at work distributing aggregates into stockpiles, and layers are built up in increments only inches deep over the full length of the piles. Of course, this would not work for stockpiling very many sizes nor for very large production. However, it has greatly improved the efficiency of this small producer with only two sizes to stockpile.

Salt for haulage roads

SEVERAL ROCK PRODUCTS producers have discovered that common rock salt can help to stabilize the surface of their roadways and greatly reduce the amount of dust the trucks stir up. One western crushed stone operator used about 18 tons of salt for nearly a mile of quarry road. The salt was distributed uniformly, carefully bladed into the surface and then thoroughly wetted down.

This treatment was enough to prevent further deterioration of the road surface and greatly reduced dusting.

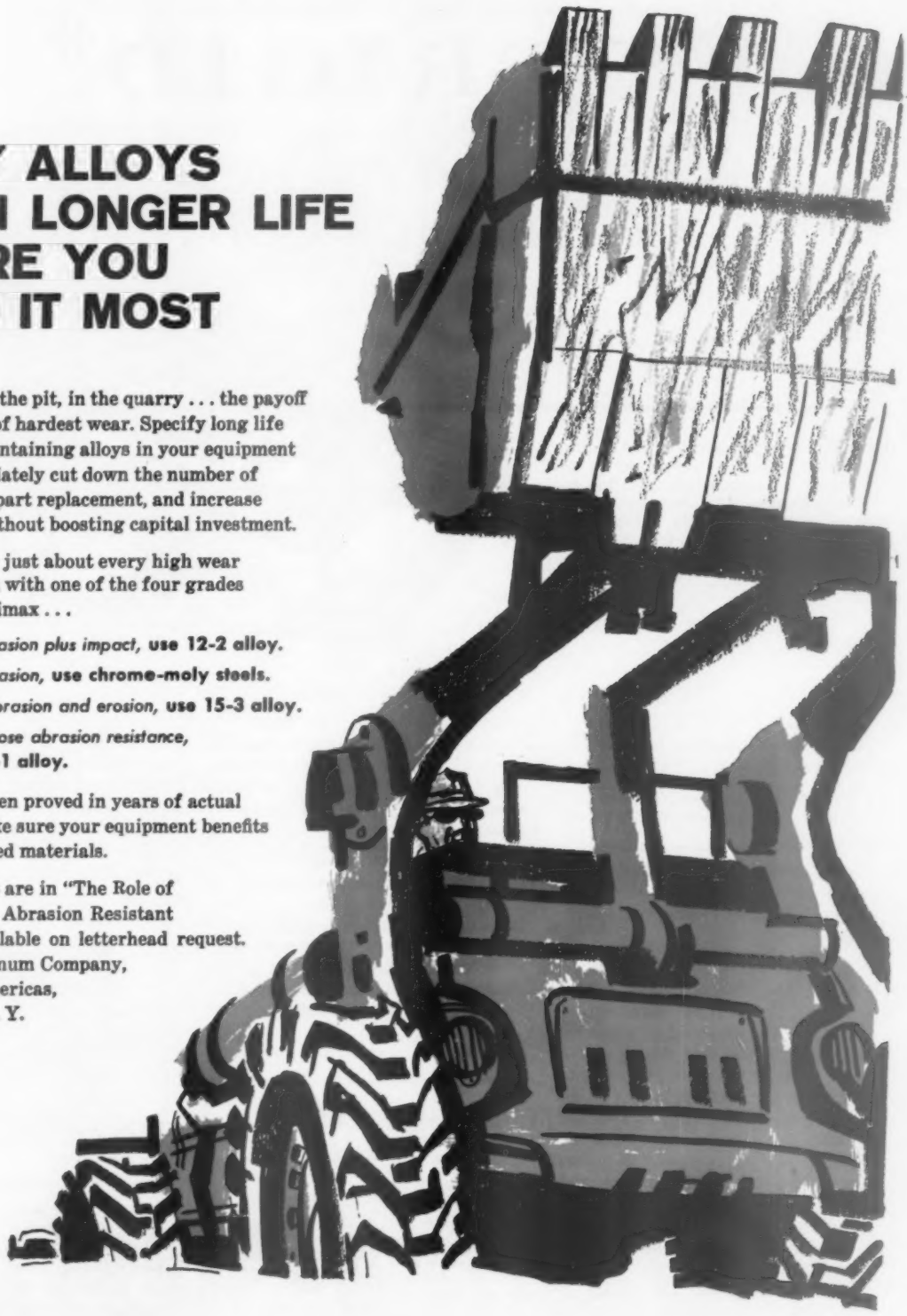
Color-coded bags

SOMETHING NEW has been added to the bagged cement put out by a western portland cement producer. To improve the visibility and recognition of the several types of commonly used portland cement, color-coded geometric symbols are imprinted conspicuously on the bags.

For example, Type I is a large numeral 1 enclosed in a vertical rectangle; colors are black and red. In contrast, Type IA is the number enclosed in a diamond with colors black and yellow. There should be no confusion between the two kinds of cement. These symbols and colors are displayed on the face and gussets of the bags.

(Continued on page 84)

MOLY ALLOYS MEAN LONGER LIFE WHERE YOU NEED IT MOST



In the mine, in the pit, in the quarry . . . the payoff is at the point of hardest wear. Specify long life molybdenum-containing alloys in your equipment and you immediately cut down the number of shutdowns for part replacement, and increase productivity without boosting capital investment.

You can satisfy just about every high wear rate application with one of the four grades developed by Climax . . .

For gouging abrasion plus impact, **use 12-2 alloy.**

For grinding abrasion, **use chrome-moly steels.**

For scratching abrasion and erosion, **use 15-3 alloy.**

For general purpose abrasion resistance, **depend on 3-2-1 alloy.**

All four have been proved in years of actual mining use. Make sure your equipment benefits by these advanced materials.

Complete details are in "The Role of Molybdenum In Abrasion Resistant Materials", available on letterhead request.
Climax Molybdenum Company,
1270 Ave. of Americas,
New York 20, N. Y.

CLIMAX MOLYBDENUM

CLIMAX MOLYBDENUM COMPANY
a division of AMERICAN METAL CLIMAX, INC.

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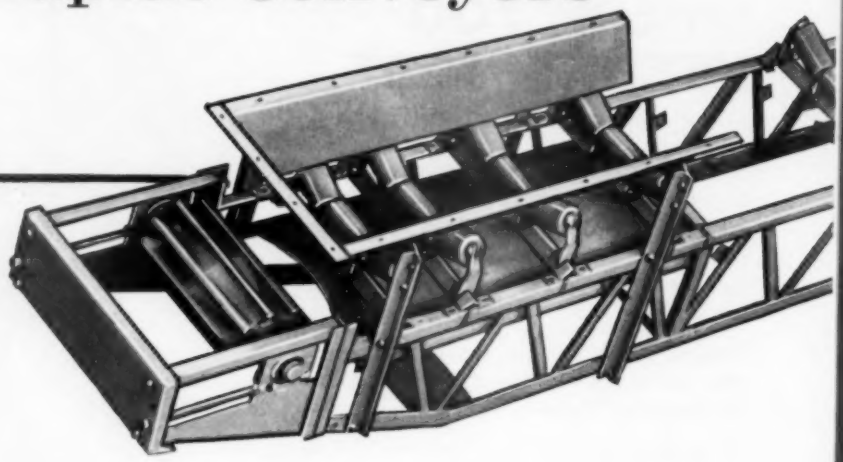
STRIGID*

is the word for new-design Cedarapids Conveyors



* Strong, Rigid construction is the prime requirement for a conveyor system that helps maintain a profitable operating pace and reduces your material handling costs. New-designed Cedarapids Lattice Frame Conveyors are engineered for strength and rigidity . . . they're "Strigid!"

What is the first thing to look for when you buy conveyors?

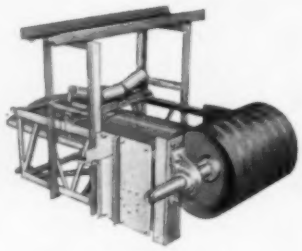
Design and construction features that insure moving more tons at lowest cost per ton.

And that's what you find when you look critically at the new "strigid" design of Cedarapids Conveyors!

Strong construction is a must for handling today's increasing hourly tonnages. Cedarapids' rugged truss design, with diagonal angle-steel side bracing the full depth of the truss, gives extra strength without extra weight; permits longer spans between supports with no sacrifice of stability. End frames are reinforced at each corner with gusset plates and securely fastened with 4-bolt connections to resist distortion from external stress. One of the many Cedarapids extra-strength design features is the wide use of clamp-on, hook-on mountings to eliminate bolt holes which tend to weaken the conveyor structure.

Rigid stability is another result of Cedarapids' "strigid" construction. Rectangular end frames between sections, reinforced with gusset plates, give added rigidity to joints. Frames are engineered for rigid, structural stability to support the load without weaving or buckling. Lateral cross bracing between side members assures extra resistance to wind sway.

True alignment is assured by pre-engineered "strigid" construction. Components are built on special fixtures and jigs, and jig-welded for the perfect alignment that comes with structural strength and rigidity. Truly accurate alignment simplifies training the belt and increases belt and roll life.

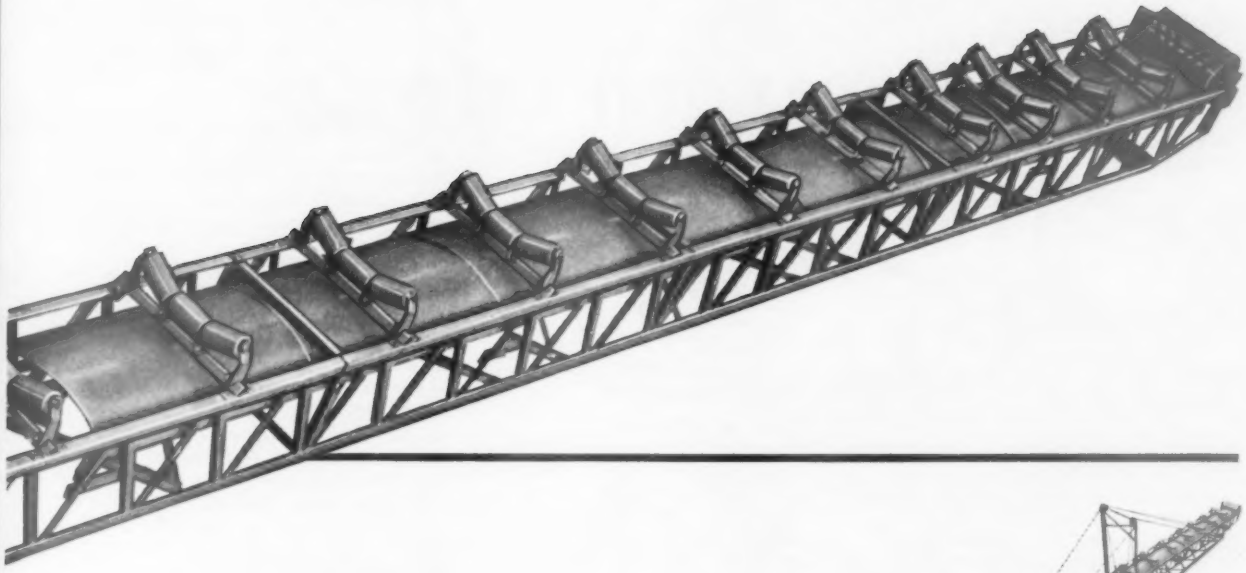


JIG-WELDED HEAD SECTIONS, box or taper styles, ruggedly designed for strength without increased weight. Wide-faced, crowned head pulleys are reinforced with extra discs for added strength. Carborundum-coated Safety-Grip Lagging reduces slippage and requires less belt tension.

Modular design means greater convenience, greater savings for you. Standardized, interchangeable conveyor components are pre-engineered at the factory for job-engineered erection that is fast, easy, and low cost. Order your modular components "off the shelf." They arrive on the job pre-fit for perfect alignment. There's no cost or delay for special engineering, special drawings or calculations. It is simple to order just what you need for your job, tailored to your requirements. And modular components cost less... our quantity production savings are passed on to you.

TROUGHING ROLLS and return idlers are made by Cedarapids for the absolute quality control that insures uniformity, perfect balance and maximum strength. Life-Seal ball bearings are permanently lubricated and sealed at the factory. Clamp-on mounting allows easy adjustment for belt training and for altering the standard 4' spacing to handle special applications.

Adaptability is another important savings benefit. Additional modular



INTERMEDIATE SECTIONS are jig-welded for true alignment. Rugged truss design permits longer spans between supports with no sacrifice of rigidity. 8', 10' and 12' sections available to adapt conveyors to any needed length in 2' increments.

conveyor components are always available from stock, ready for immediate delivery. You can extend or alter your conveyor system in the field with minimum time and cost. Add clamp-on troughing rolls to handle greater loads when necessary. Head and tail sections accommodate a useful range of shaft, bearing and pulley sizes without structural alteration.

Cedarapids "Strigid" Conveyors are pre-engineered to cover a wide range of applications, handling light or heavy materials horizontally or on an incline, with belt widths from 18" to 36", in any even foot length. Components are designed for fastest, easiest erection and quick field alterations to meet changing needs.

Start saving material handling money today. Your Cedarapids Dealer can give you a quick quotation for prompt delivery of your Cedarapids "Strigid" Conveyor.

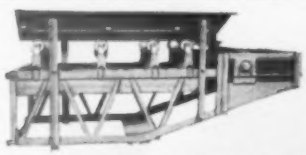
CEDARAPIDS portable lattice frame conveyors are engineered with the same strong, rigid design as "strigid" stationary conveyors. Cable method of erection saves on maintenance. A self-locking independent hand or electric winch adjusts conveyor to any height up to 22°. Cedarapids Strigid portables are available in 18", 24", 30" and 36" widths, in lengths up to 70 ft.

SEND FOR THESE NEW BULLETINS

Cedarapids "Strigid" Conveyors incorporate so many new design features it takes a 16 page bulletin to describe all their money-saving, profit-making details. When you send for your copy of Conveyor Bulletin CON-2, be sure to ask for the new Conveyor Selection Manual containing necessary tables and charts and listing lengths, widths, drives, horsepower and all other data you need to select your tailor-made conveyor components "off the shelf."

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa



JIG-WELDED TAIL SECTIONS, in both taper and box styles, are interchangeable. Clamp-on hopper framework eliminates bolt holes to maintain structural strength. Self-cleaning wing type tail pulleys feature the same quickly detachable hubs used in the head pulleys.

Cedarapids
Built by IOWA

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa

Gentlemen: Please send Bulletin CON-2 with details about Cedarapids new-design Strigid Conveyors. Also send the Conveyor Selection Manual.

Name_____

Company_____

Address_____

City_____ State_____

S860-N

Enter 1412 on Reader Card

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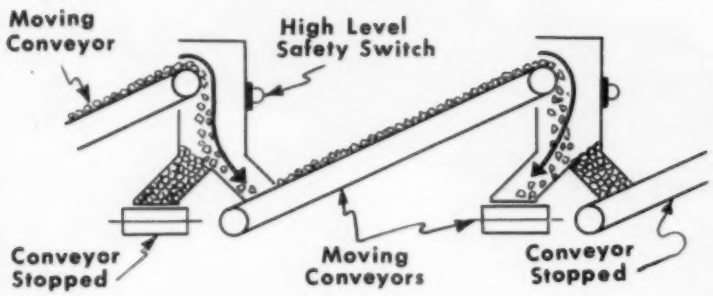


Chutes act as gates to control material flow

THIS DEVICE for eliminating flop gates or rack and pinion gates has been around the rock products industry for years. But recently we have seen a surge of renewed interest in several different plants.

The idea is simple. Material is allowed to build up in the leg of a chute to divert the flow to the other chute. The flow of material is determined solely by the movement of the conveyors below the chute.

A western sand and gravel plant uses the idea to divert material from one processing circuit to another. But here the chutes are in the bottom of a deep surge bin.

A midwestern cement maker develops the idea along the design shown in the sketch, to distribute raw materials into storage silos over ball mills. When the cross conveyors are stopped, the materials continue on to the next distribution point. Bin level controls in the chutes are interlocked to assure that there is always a place to put incoming rock. But if the first control signals a block in the chute, the crushing circuit is stopped. The controls not only control other belt conveyors in the system, but sound an alarm and light a red light on the plant's control board.

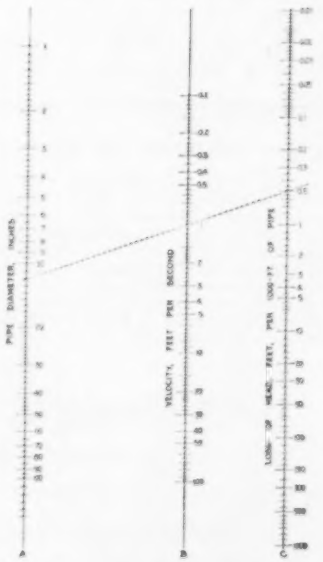
Contributions? Of course

When we visit rock products plants in our travels we are frequently asked if contributions are accepted for Hints and Helps. The answer is—of course they are.

The editors in the field keep a sharp eye out for a producer's ingenious mechanical inventions but they cannot possibly notice every one. So, if you have a Hint and Help in your plant, feel free to send us a brief description along with a photo or sketch.

You will then have the satisfaction of helping producers in all parts of the country. And for your helpfulness, ROCK PRODUCTS will send you a crisp green check for $5.00.

Loss of head in water pipe



HERE'S A HANDY CHART that instantly gives the velocity, pipe diameter or loss of head in the simplest way. Every reader doubtlessly knows that the flow of water through a given pipe usually decreases in time. It decreases because of alteration of surface conditions within the pipe. Crusts sometime form or rust and dirt build up. And, as a result, there is lessened diameter, greater friction and loss of head. The internal friction, in other words, increases depending on the quantity and nature of the scale or rust. It also depends on the length of time the pipe has been in service.

To compute the diameter of a pipe of a size sufficient to take care of such losses under average normal conditions, there is a formula which is rather difficult to apply by many of us. It is a so-called "empirical" formula, and it has exponents that are cumbersome to use. So, the accompanying chart has been plotted, based on that formula. This chart gives the relations between the actual internal diameter of the pipe in inches, and the velocity of flow of the water in feet per second. For example, the dotted line drawn across the chart shows that if the internal diameter is 12 in., column A, and the velocity of the water is 1 ft. per sec., column B, the loss of head is ½ ft., per 1,000 ft., of pipe, column C.

The chart can be used in three different ways. Knowing two of the values in columns A, B, and C, the third value is quickly determined by means of a single straight line, as above.

W. F. Schaphorst, Newark, N. J.

Sectional controls for sand and gravel plant

CONTROL CONSOLES operate nearly all operations of a western sand and gravel plant. High above the plant is an enclosure in which a remote control console is located. From here an operator electrically controls all equipment used in screening, crushing and heavy-media separation. The equipment interlocked with the conveyors is started and stopped from this central console.

Above a concrete batching plant is a second central control console that controls the reclaiming belt conveyor below the aggregate stockpiles, the feeders and the electrically controlled, air-operated gates. A duplicate control panel at ground level may be operated in an emergency by another man if the batch plant operator happens to be busy with batching mixer trucks.

A third electrical control console is in the scale house. This is used to control the flow of aggregates. Both quantity and blends of sizes can be selected and taken through the reclaiming tunnel below the stockpiles to the bins above the truck and trailer units waiting on the platform scale.

END

B.F.Goodrich

Copter hop over the new Niagara

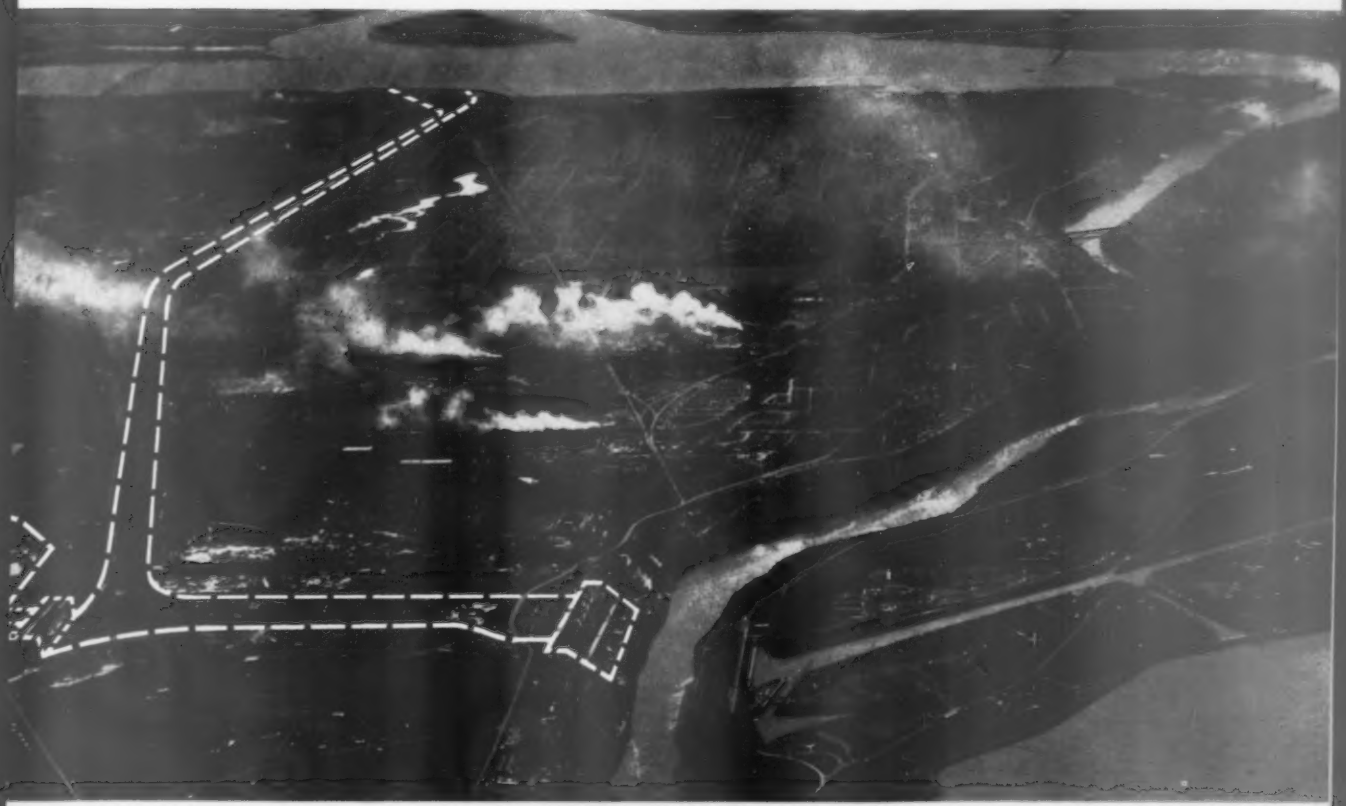
Ride in the Bell Ranger and see how B.F.Goodrich tires help build the world's mightiest power project

SOON THE CHURNING WATERS of the Niagara River will be generating more electrical power than ever—over two million kilowatts, enough to light a city the size of Chicago.

More electricity at lower cost is what we'll get from the $720-million Niagara Power Project, one of the biggest peace-time construction jobs in our history.

Already trucks and other earth-movers have shouldered their loads more than 800,000 times—enough trips to take them ten times around the world.

To cope with the challenges of this and other tasks, Merritt-Chapman & Scott Corporation, largest contractor on the project, uses B.F.Goodrich tires and other products.



NOW WE'RE AT 3,000 FEET. Below us is the entire Niagara Project. At the upper right are the Falls. At upper left, 2½ miles above the Falls, is the Intake Area. Here water will be diverted from the Niagara River into 2 giant covered conduits, each of which is as wide as a 4-lane highway and 5 times higher than the Holland Tunnel. These conduits take the water into the vast Storage Reservoir. From there it moves to the new Niagara Generating Plant, where it plummets down to drive 13 generators. Turn the page and learn how this mammoth job is progressing with the aid of B.F.Goodrich tires.

This B.F.Goodrich report continues ▶

SWOOPING DOWN we come over the conduit area that will carry water from the Niagara River to the new reservoir. Excavations for the 46′-wide covered conduits are 110′ x 50′. The trucks below us, hauling away rocks, are equipped with B.F.Goodrich tires. Altogether, more than 2100 B.F.Goodrich tires—on dump trucks, loaders, graders and other equipment—work 'round the clock, six days a week, rolling over rock-strewn Niagara excavation sites.

See how 2100 B.F.Goodrich tires

B.F.GOODRICH ROCK SERVICE TIRES have run up amazing service records at Niagara—over 5,000 hours in some cases! The new B.F.Goodrich Cut Protected tread compound is outstandingly successful at withstanding cutting and chipping from abrasive Niagara rock. Massive double-chevron Rock Service cleats give extra traction in forward or reverse. And because of the B.F.Goodrich Flex-Rite Nylon cord body, Rock Service tires are almost immune to heat blowouts and flex breaks. Result: you get more original-tread hours of service, more retreadable tires.

TO GIVE CONTRACTORS what they need *when* they need it, B.F.Goodrich built a warehouse near the Niagara project. A complete line of B.F.Goodrich tires is stored, ready for every emergency. At the B.F.Goodrich Tire Service Building on the job site, a crew of trained tire maintenance men works in shifts, 'round the clock.

IT'S AN EMERGENCY, and the B.F.Goodrich Tire Service Man is there. He's trained to handle any type tire on any type equipment. He has at his disposal all the latest power tools, such as hydraulic cranes, pneumatic wrenches, bead jacks. Background: 13 penstocks at Niagara Generating Plant will direct torrents of water into giant turbines. Penstocks are 462 feet long.

are helping men harness Niagara

From the beginning of work on the Niagara Power Project, B.F.Goodrich on-the-scene specialists have helped determine exactly the right B.F.Goodrich product for each particular job. In addition to Rock Service tires (now available in the new Cut Protected compound), B.F.Goodrich Rock Logger, Tractor Grader, All-Purpose, Mud-Snow and Power Express tires are at work.

B.F.Goodrich hose feeds air to machines drilling dynamite holes. B.F.Goodrich rain suits, gloves and footwear protect hundreds of construction workers.

B.F.Goodrich conveyor belts will carry materials for 1,300,000 cubic yards of concrete, total required for the entire generating plant. And helping to keep the whole project humming are special B.F.Goodrich maintenance and service facilities—all part of the new B.F.Goodrich Unified Contractor Program.

No matter what your off-the-road job, B.F.Goodrich is ready to serve you, and help you save. Your Smileage dealer is listed under Tires in the Yellow Pages of your phone book. *The B.F.Goodrich Company, Akron 18, Ohio.*

SPECIFY B.F.Goodrich Tubeless or tube-type tires when ordering new equipment.

Smileage!

B.F.Goodrich *off-the-road tires*

ROCK PRODUCTS
October 1960

Domestic and foreign producers slug it out for rich seaboard portland cement markets

Cement imports pose threat

by Joseph N. Bell

THERE'S A NEW AND GROWING THREAT to the American cement industry from overseas. The volume of imported cement is growing steadily—now devouring domestic markets in gulps rather than the nibbles of years past. And the threat is made more serious because it is being rather universally ignored by a large segment of the cement industry that isn't—at the moment, at least—directly affected.

These are the convictions of a group of eastern cement manufacturers as expressed to this reporter. Investigation—including interviews with cement industry executives, Congressional representatives, union officials and federal government legal experts—bears out the seriousness of the situation and its growing influence on the rock industries. Although those interviewed offered a wide range of opinions—many of them contradictory—five salient facts emerged from ROCK PRODUCT'S investigation of the imported cement problem:

1. Imported cement as a threat to domestic producers is growing at an accelerated pace. Less than 3,850,000 bbl. of imported portland cement came into the United States in 1957. These imports, which were more than 3 million bbl. in 1958, jumped to almost 5 million bbl. in 1959, and will likely be about the same in 1960.

2. The chances of getting a protective tariff on portland cement through Congress are remote and growing slimmer every day.

3. The only other official avenue of help is through the Bureau of Customs in the Treasury Department—and here decisions have almost solidly been rendered against domestic cement producers whenever complaints have been filed.

4. There is wide divergence of feeling among American producers about the seriousness of the situation, and little inclination—except among those who are presently being hard hit—to attempt to do anything about it.

5. The number of foreign cement companies—and the capacity of existing overseas producers—is growing steadily, and most of them are sighting in on the American market. This situation is likely to get worse before it gets better.

The question understandably arises: If foreign cement producers are able to undersell American manufacturers so drastically, shouldn't this be a challenge to American producers to operate more efficiently and meet this competition with lower prices for domestic cement? While admitting the legitimacy of the query, the producers involved say the problem is much more complex than a simple answer to this question. Essentially, they say, it boils down to this: Foreign manufacturers are making price concessions in the United States that are far below their own domestic prices—and which American producers couldn't meet no matter how efficiently they operated.

How is this possible? Let's take an example. The price of domestic cement in Norway was recently $2.50 per bbl. Norwegian producers were selling it to an American importer for $1.85 per bbl. They are willing and able to do this for two reasons: It provides them the efficiency and savings of mass production, and it enables them to take advantage of remarkably low transportation rates offered by ship owners with empty freighters in European ports. There is also a saving in the unloading of imported cement at non-union ports, a point which will be discussed later.

According to American manufacturers most closely affected, this Norwegian cement is coming

Please turn page

LEFT: Some ships importing cement into the eastern seaboard are equipped with highly efficient bulk-loading and unloading machinery

CEMENT IMPORTS POSE THREAT

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into the United States in violation of our import laws which require that the price at which the imported product is offered here must be related directly to the selling price in the producing country. Any variance beyond a "reasonable allowance for quantity discount" can be construed as violation of American anti-dumping laws—that is, laws preventing foreign manufacturers from dumping their products in this country at a price ridiculously below the going price in the producer's country. Precisely what constitutes a "reasonable allowance" is a matter that is now in hot dispute between the Treasury Department and a group of American cement producers who are being badly hurt by the imports.

This group of 12 American producers recently filed suit in District Court in Washington, D.C., seeking an injunction to prevent the Treasury Department from dismissing anti-dumping charges against Norwegian cement producers. Domestic producers (of any commodity) who are being hurt by the "dumping" of foreign goods can petition Treasury to suspend this practice and hook on an additional duty to the offending importer. If Treasury feels the petition is justified, it can suspend the appraisal of value to the importer until a firm decision is rendered.

This involves a considerable risk to the importer who might lose his shirt in the event of an unfavorable decision, so the weapon is a potent one if Treasury elects to use it. It has consistently refused in the importation of cement. In the case of Norwegian cement, although an appraisal had been withheld since June 12, 1959, the importer's attorneys were notified privately that the charge would be dismissed. It was at this point that the 12 American cement companies filed their suit against Treasury.

CEMENT IMPORTS IN FOUR LEADING STATES (Bbl.)

Connecticut	463,000	851,000
Massachusetts	58,000	365,000
Florida	1,480,000	1,290,000
Rhode Island	151,000	328,000

U. S. IMPORTS OF PORTLAND CEMENT, BY COUNTRY OF ORIGIN
(U. S. Bbl., excluding White Cement)

	1958	1959
Canada	657,100	1,491,200
Colombia	473,900	791,400
Belgium	410,800	581,400
West Germany	325,100	578,600
Sweden	304,700	280,700
Norway	270,800	454,400
United Kingdom	209,700	143,000
Denmark	192,800	129,800
Poland	68,500	42,600
Israel	58,200	349,000
Yugoslavia	47,500	67,400
Egypt	32,600	53,000
Switzerland	19,500	—
Japan	18,000	100
Mexico	10,800	10,200
Dominican Republic	7,500	—
France	3,100	—
Bahamas	—	2,500
Total	3,110,600	4,975,300

The background facts are well established. Norwegian cement is being sold to a Connecticut importer at about 9 percent (some figures run as high as 14 percent) less than in the home market in Norway. Of this 9 percent, a savings of about 4 percent is reportedly made in selling cost of cement shipped to the Connecticut importer. The remaining 5 percent differential is the bone of contention; Treaury contends that this is a proper allowance, or "discount," for large quantity sales, whereas the complaining domestic cement producers contend that it is not a "legal and proper" allowance unless it is fully justified on a cost-accounting basis, and that, at least for legal argument purposes, 5 percent is a measure of the extent to which Norwegian cement is being dumped in the Connecticut market.

Treasury's position is fundamentally that it need not, and probably could not, make a cost-of-production study covering the Norwegian manufacturer, and that 5 percent is a "fair" estimate of probable savings in manufacturing costs that can be credited to large quantity sales in Connecticut. The domestic cement producers maintain that if Treasury can't or won't make such a study it can't legally approve any percentage.

The cement companies' brief declares that dismissal of the dumping charge against Norway ". . . would be contrary to and in disregard of Section 201(b) (1) of the Anti-dumping Act which permits due allowance for quantity discounts only to the extent that such discounts reflect savings in cost of manufacture as a result of the large quantities ordered . . ." The producers further charge that they have ". . . in the past lost hundreds of thousands of dollars in revenues because of the unfairly low prices for Norwegian portland cement in the Connecticut markets, and will continue to lose additional hundreds of thousands of dollars in revenue unless the provisions of the Anti-dumping Act are legally and properly applied."

The producers' brief points out the existence of similar anti-dumping complaints (filed by the same firms) against several other countries, and while

the brief does not say so in words, it is apparent that the producers are afraid that if dismissal of the dumping charge against Norway is allowed to go unchallenged a precedent will be set for dismissal of charges against the other countries.

Early in June of this year the U. S. Court of Appeals for the District Court denied the injunction and set a full hearing on the case for the Fall of 1960. If the appeal is granted, the case will go back to the same District Court that ruled in May that it didn't have jurisdiction. This would then mean a long, dragged-out court fight—which the companies involved are determined to see through because there appears to be no alternative; this in spite of the fact that the producers involved—looking at the matter realistically—are not too sanguine about their chances of winning in the face of numerous discouragements.

One of these—and perhaps the most important one—is the absence of help for the producers waging the fight from two sources that could logically be expected to render help:

- Cement producers not directly affected by the influx of imports have taken a detached position in the matter. Almost 60 percent of cement imports come into four states: Connecticut, Massachusetts, Rhode Island and Florida. Producers in areas not affected are generally indifferent to the problem. The companies being hurt are saying with increasing volume that unless a concerted and effective stand is taken against the dumping of overseas cement in the United States, the growing influx of imported cement will hurt all domestic producers in time.
- The United Cement, Lime & Gypsum Workers International Union has taken no action or public position in the matter. Yet a number of union members are being laid off or losing their jobs entirely because imported cement has caused a cutback in domestic production. The crucial point here is that one very large reason imported cement is able to undersell domestic production is because it is being unloaded at much lower cost than normal at non-union ports in Connecticut.

Yet, there has apparently been no effort on the part of the American cement producers affected to discuss this problem with the Union—which could certainly bring some pressure to bear in labor councils to remedy this situation.

I discussed this with Toney Gallo, Secretary-Treasurer of the Cement, Lime & Gypsum Workers. He told me that he knew nothing about non-

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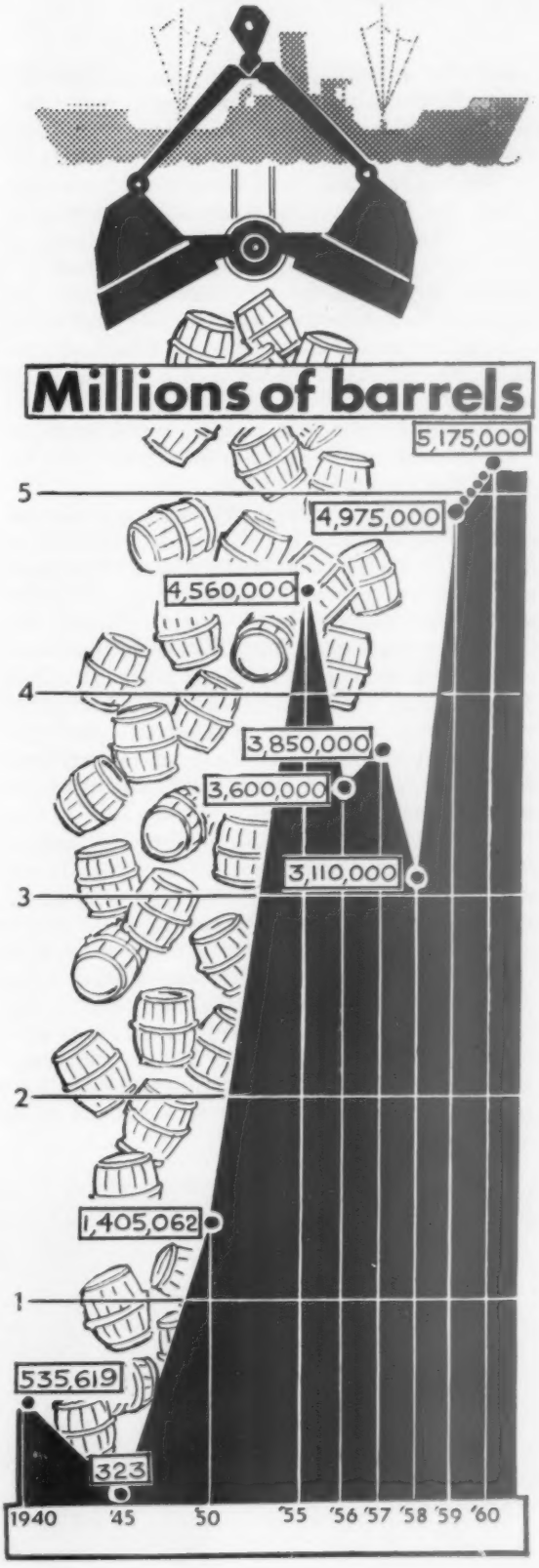
How United States imports of portland cement are rising



CEMENT IMPORTS POSE THREAT

continued from page 91

union labor unloading imported cement. Then he added: "The cement companies have never requested our help in meeting this common problem. When and if they do, we'll be glad to cooperate in any way we can. Naturally we're very much concerned, too. We have, on occasion, talked with a number of employers about pooling our resources and going to work jointly to seek a solution to the problem of growing imports. But apparently the companies have hesitated because they don't want to be under any obligation to us. Whatever the reason, the offer still stands, and it will continue to stand."

Let's take a brief look, here, at the background of the cement import problem to help put it in its perspective.

Since the cement industry in North America began to grow in the early 1900's, the United States has been by far the largest manufacturer of portland cement in the world. Because of the expensive production equipment required and the high cost of transporting cement long distances, there was never any serious import problem until the middle 1920's. During the 30's and 40's several attempts were made by importers to compete with domestic cement, but the American producers met and bettered their prices and drove this competition out of the country.

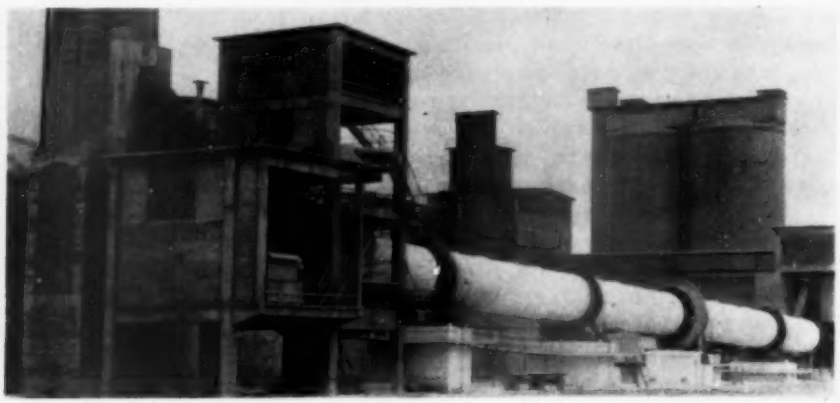
Then, about 10 years ago, imported cement began to come into Florida in large quantities. It was badly needed there, was of good quality and supplied the needs of a vastly growing market that wasn't able to get the cement it needed anywhere else. But a few years later, a situation arose in the northeastern United States that was quite different. When all the cement plants in that area went out on strike for seven weeks in 1957, importers saw their chance and brought in a large supply of Scandinavian cement. During a period when cement was very difficult to find, this imported cement was sold to eager contractors, sometimes with the understanding that they would continue to buy from the importers even after domestic cement was again available.

When cement sales slacked off in 1959, importers made price concessions that further solidified their position in the domestic markets of the northeast. This trend has continued in 1960, and the imported cement has spread from its original beachhead in Connecticut over a number of eastern states (about 32 percent of the cement now used in Connecticut is imported). In general, this cement is of good quality. Efforts of domestic cement manufacturers to compete by cutting prices have been considerably hamstrung by government edicts. In the basing point decision of 1945, cement companies were ordered to cease and desist in conspiring to drive out foreign competition. And when one American company cut its price drastically to meet foreign competition in the current crisis, FTC investigators descended immediately and the cut was withdrawn.

Thus, today, it seems apparent that any easing of this situation will have to come about through the efforts of individual cement companies, working cooperatively through the courts. The legislative door appears to be closed. I discussed this possibility with legal representatives of the House Ways & Means Committee which would have to originate any legislation in this area.

Thomas Martin, minority advisor, told me: "Cement is one of many commodities facing tough competition from overseas production. There has been no discussion of protective legislation for cement in the Ways & Means Committee. In the present political climate, a domestic producer is almost committing a criminal act if he tries to get tariff protection."

THIS AFRICAN CEMENT PLANT is as modern and efficient as many portland cement plants in the U. S.



Leo Irwin, majority legal representative, was much more blunt: "I get sick of hearing domestic manufacturers of all kinds whimper for protection," he said. "Every time the going gets tough, they want protection. There are hundreds of commodities hollering for it, but there haven't been any new protective tariffs passed in years and there probably won't be.

"There are two avenues for relief—through Congress and the Tariff Commission. There isn't a chance in Congress. But if the domestic producer can show distress or prove illegal importing activities, he can get help from the Treasury Department— if tariffs have been lowered by presidential order from a point earlier established by law, or if the law is being violated by the importer."

In view of all these dissenting voices, where, then, do we stand on imported cement?

One producer, deeply affected, summed it up bitterly this way: "Right now, in a case of violation of the import laws, the burden is on the domestic producer to prove the importer is operating illegally. Why shouldn't it be the other way? Why shouldn't the importer have to show that he is operating clearly within our laws before he is permitted to sell his product here? We have to dig out the facts in the case, then the Treasury Department refuses to accept our evidence while taking at face value whatever the importer tells him.

"We're not afraid of competition. We're willing to slug it out with foreign producers on a competitive basis as long as they have to play by the same rules that we do. But that certainly isn't the case today. It's hurting—and it's going to hurt even more."

In the meantime, cement producers abroad are growing—and casting a speculative eye at American markets. Now that the St. Lawrence Seaway is open, there will be increasing efforts to send imported cement into the Great Lakes area. Symptomatic of the times is a new cement plant in Egypt that is offering a premium of 17.5 percent to Egyptian exporters who sell to hard currency countries (equivalent to a discount of about 12 percent in posted prices).

What can be done?

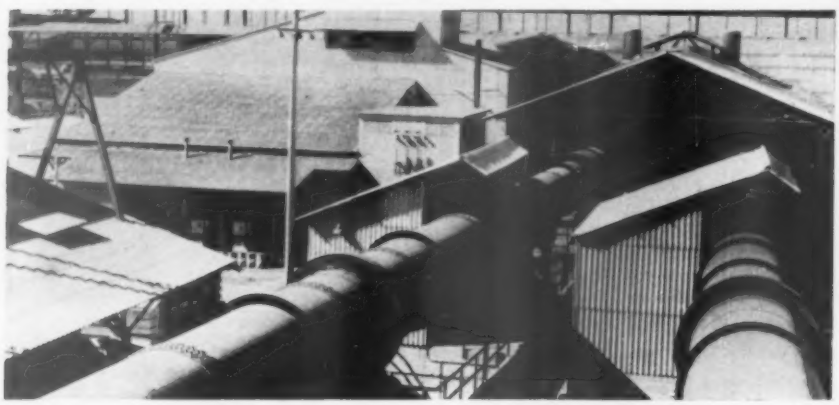
1. Court action, similar to the one now pending in Washington, can be initiated to force Treasury to define what is meant by a "reasonable allowance," and also to re-assess the operations of exporters who are selling well below their own domestic prices.

2. The dumping law could be amended in such a way as to force the suspension of imports when an exception is filed—until the case is investigated and a ruling handed down. This would speed up the handling of such cases now buried in Treasury red tape.

3. Importers could be required to obtain a license from the Treasury Department after showing that they are clearly operating under the laws of the United States.

To bring about any of these reforms will require a much more coordinated movement among domestic cement manufacturers than is now apparent. It will also require the help of other affected people, such as those in the Cement, Lime & Gypsum Workers Union.

There is no indication, as of now, that any such movement is underway. Apparently, things will have to become more crucial before such group action is undertaken. But the manufacturers presently engaged in a life-or-death battle with the importers are shaking a warning finger at the cement industry. They're saying that if the present trend continues, things will get much worse—and very soon. And they just might be right, too. END



ON THE OTHER SIDE of the world is a cement plant in Central America that can earn badly needed dollars by sending cement to the U.S.

ZONOLITE'S NEW VERMICULITE PROCESSING PLANT at Enoree is surrounded by lakes that supply processing water

Production booms in South Carolina for this rare non-metallic mineral

Vermiculite sparkles in modern industry

by Oliver S. North

IN THIS era of concentrated products, when men boil, freeze, spin and screen a substance right down to its essentials, vermiculite stands out as a natural. This relative newcomer to the rock products industry originates in an extremely compact state, is further concentrated in the milling process, and expands (exfoliates) 8 to 12 times its size when heated. It is truly a product of this century, because the vermiculite industry has developed largely in the last generation. In a very short time it has worked out highly efficient methods of mining and manufacturing the ore.

So rapid has been the growth of the vermiculite industry and so widely accepted are its products—as insulating fill, plaster and concrete aggregate and in a hundred other applications—that more is generally known about its markets than about its origin. For example, did you know that two of the world's three largest producing deposits are located in the United States? They are worked by Zonolite Co. in Libby, Mont., and near Enoree, S.C. (The third major producing deposit is in the Transvaal, part of the Union of South Africa).

When you consider that deposits of commercial significance are few and far between, you can appreciate the ore's physical characteristics even more. Generally, it is milled at or near the point of mining and is transported to expanding plants close to the point of use. In this way, producers save greatly on transportation costs.

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VERMICULITE SPARKLES IN MODERN INDUSTRY

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John B. Myers, Zonolite consultant and writer of the chapter on vermiculite in the standard reference book, Industrial Minerals and Rocks, explains that the mineral takes its name from the Latin vermiculari, "to breed worms." This micaceous mineral, defined as a hydrated magnesium-aluminum silicate, splits readily into thin flakes. Each flake consists of crystals composed of two layers of silicate separated by water.

The important characteristic of expansion is believed, says Mr. Myers, to be a mechanical separation of the layers when the contained water is converted to steam. Heated quickly to a temperature of 2,000 to 2,500 deg. F., the flakes expand into long, wormlike pieces.

To acquaint ROCK PRODUCTS readers with this progressive segment of their industries, I interviewed J. A. Kelley, president of Zonolite. Now headquartered in Chicago, Mr. Kelley was for many years in charge of the company's operations in South Carolina.

The South Carolina operations are outstanding in two respects: There, Zonolite processes one-third of all the vermiculite produced in the U. S. Also, the manufacturing process features the 800-tpd. Kearney mill, which is called the newest and most technically advanced mill in the vermiculite industry. Mr. Kelley was instrumental in designing it, along with O. F. Stewart, now mill manager, and Zonolite engineers. This is a wet mill, and was named the Kearney mill after the company's board chairman, A. T. Kearney.

Actually, the mining area near Enoree consists of not one, but nearly a hundred deposits. The ore masses in the rolling country of western South Carolina are scattered like raisins in a cake, occurring at unpredictable points south of the Tiger River in Spartanburg, Union and Laurens counties. These deposits are associated with bodies of biotite —similar in structure to vermiculite, but containing potassium between silicate layers instead of water. Hornblende, quartz, feldspar and clays are other major impurities in the deposits.

Zonolite geologists believe the vermiculite deposits were formed by near-surface weathering alteration of biotite intrusives, although usually there is fairly sharp demarcation between the vermiculite and biotite bodies. Vermiculite is selectively mined away from the biotite, so that very little of this material is sent through the mill, where it presents a difficult separation problem.

Exploration comes first in Mr. Kelley's enumeration of the mining processes. Zonolite's active exploration crew, under the direction of A. H. Skardon, locates and tests vermiculite occurrences, pulling samples with auger-type drills. Only one of every 8 or 10 deposits they examine is of commercial nature. These factors determine commercial deposits: tonnage in the deposit; particle sizes of vermiculite present; purity, and distance to the mill. In addition, the deposit must be suitable for open-pit mining.

While the company has not released any definite estimate of total reserves, it has stated that the quantity of commercial vermiculite in South Carolina is probably much more limited than at its Libby, Mont., mine. Some of the orebodies held in reserve were lost to the company when the properties were taken over for highway construction.

The exploration crew has found orebodies up to 18 miles from the mill, and the pit currently producing is 7 miles away. As a matter of public relations and mill control, Zonolite mines only one deposit at a time. Its usual practice is to lease properties on a royalty basis, paying higher royalties for richer ores.

This is how a deposit is worked: Overburden is stripped by shovel or dozer and the ore is mined by ½ and ¾-cu. yd. shovels. The small shovels are preferred for their selective mining ability and lighter weight. They load the ore into dump trailers. Overburden and waste are back-piled and either loaded out into trucks or moved by dragline to a spoil pile.

Frequently the crews underload the trucks because of the type of roads they must travel. Occasionally, empty trucks can take a short, direct route to the pit, but when loaded must return to the mill via a roundabout route to stay on better roadbeds.

The mill layout results from years of experimentation with various types of ore dressing equipment—experiments which still continue. Currently, tests are under way with spirals, shaking tables and froth flotation cells. The new mill is about 45 miles from Travelers Rest, S.C., where Zonolite maintains an office, a laboratory and an expanding plant. The old mill was also at Travelers Rest, where Zonolite has been in operation since 1946.

There were several reasons, says Mr. Kelley, for using the wet milling process: elimination of virtually all dust; more effective removal of clays and other fines; greater facility in moving the feed through the mill circuit; reduced wear on equipment, and production of a top-quality material for use in expanding furnaces.

The flowsheet for the Kearney mill is shown. Taken from a large pit at an elevation above the

mill, the ore is reclaimed by a hydraulic monitor that breaks the lumps, frees the slimes and flushes the ore into the mill. Oversize is reduced by a hammermill crusher, and water and slimes are separated from the ore in a rake classifier.

Washed ore then goes to a surge bin, from which it is fed at a controlled rate to a specially designed rod mill which further liberates and delaminates the vermiculite flakes. The prepared ore is pumped to a wet screening plant and separated into several fractions.

Certain fractions need no further concentration. The remaining fractions are sent to a table flotation plant which employs the amine process of separation. The reagents condition the pulp to waterproof the vermiculate particles and thereby render them selectively floatable on the tables. Middling, or particles still mixed with waste from a primary bank of tables, are re-treated on secondary tables.

All concentrates now are dewatered in a centrifuge and dried in a rotary tube dryer. Damp material is fed to the 6 x 60-ft. dryer, heated by a combustion chamber fired with No. 5 fuel oil. The temperature is maintained below that at which partial exfoliation would take place—exhaust gases from the dryer are controlled in the range of 260 to 270 deg. F.

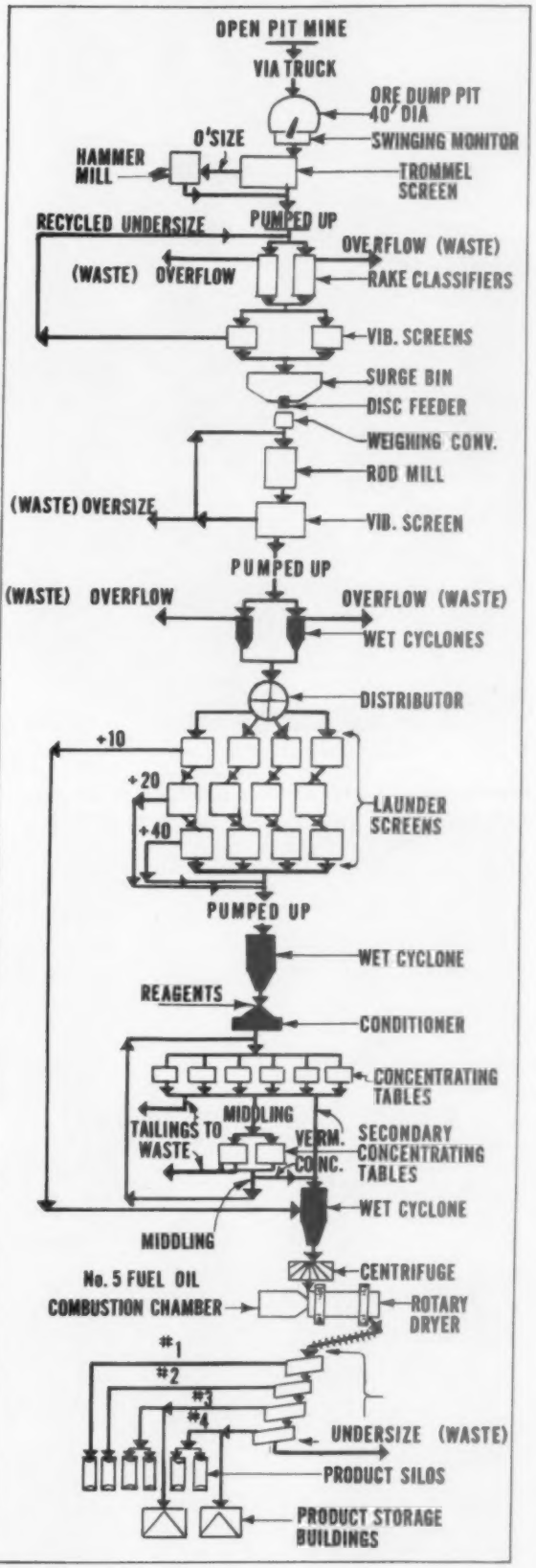
Dried vermiculite concentrate is elevated and processed over a bank of vibrating screens to produce four principal grades:

No. 1—plus 6 mesh
No. 2—minus 6 x plus 8 mesh
No. 3—minus 8 x plus 28 mesh
No. 4—minus 28 x plus 65 mesh

Each grade is stored in 100-ton silos, with two silos each being required for grades 3 and 4. Excess material is piled in storage to meet seasonal demands and can be drawn into silos as needed. Fine material, which has a limited market, is accumulated in a storage shed.

Most of the sized concentrate is loaded into box or hopper cars for shipments to expanding plants in the South, East, Midwest or Southwest. As mentioned before, shipping the concentrated ore saves considerably on freight costs. Think how bulky the cargo would be if the ore were shipped after expansion!

When expanded, the vermiculite weighs between 4 to 10 lb. per cu. ft. The mill prepares the ore to a predetermined moisture content that will give the best result for the particular type expanding plant that is used. The screen analysis is controlled so that, after expansion, the product will meet the various specifications. END



GRIZZLY AND PRIMARY JAW CRUSHER are combined in a neat package on a big trailer

TRAILER-MOUNTED VIBRATING SCREENS placed side by side make finished aggregates and keep cone crushers busy at same time

Trailer-mounted integrated setup pours out sand and gravel at 700 tph. for California producer

Teichert teams capacity and mobility

by John H. Bergstrom

TO SAY THAT A PORTABLE sand and gravel plant moves on five trailers and a van sounds good, though it may raise no eyebrows. But the plant's peak productive capacity of 700 tph. will certainly arouse the curiosity of even the most experienced producers in the industry. How is it posisble to get that much production out of that size package, and still be able to move it around and resume production in four days' time?

The man who does it regularly is Peter Werner, knowledgeable plant engineer for A. Teichert & Son, Inc., of Sacramento, Calif. Largely through his efforts, this custom-built plant does not sacrifice capacity to mobility.

The plant has had ample opportunity to demonstrate portability and ease of erection in the two years it has been used to supply aggregates for roadbuilding jobs in northern California. While doing so, it has replaced four permanent plants! Clues to its satisfactory performance are found in these design features:

(1) Ingenious crusher arrangement in which even heavy cones are trailer-mounted, stabilized effectively by the generous use of rubber padding.

(2) Unitized design of each major component, with each on a separate trailer unit.

(3) Self-supporting conveyor system. All 14 units are contained in hinged steel supporting trusses for easier handling.

(4) A special van to contain the controls.

Selection of crushers was the biggest problem. Since the plant produces a sizeable amount of minus ¾-in. hot-mix aggregate, considerable crushing is necessary. Here's how it was worked out: A 24 x 36-in. jaw crusher, mounted on a 33-ft., heavy-duty trailer was selected as the primary crusher. To complete an ideal arrangement, a 4¼-ft. standard cone crusher is the secondary, with a 4-ft. shorthead cone crusher in a recrush circuit.

Here, the engineers had to cope with a serious problem: The dynamic stresses set up by the movement of the 4-ton main shaft and head assembly of the cone crusher were more than any conventional trailer mounting could handle. Any mounting method that required pouring of concrete or digging of holes at the job-site was ruled out. Ease and simplicity of erection was a prime object.

No other type of crusher seemed adequate, so the Teicherts enlisted the help of the crusher manufacturer in trailer mounting the two big cones. The joint efforts of Pete Werner and the manufacturer's engineers resulted in an unusual, but satisfactory arrangement.

Each crusher is mounted on a heavy-duty, 33-ft. trailer. Between the crusher and the trailer bed are eight 8 x 8 x 2-in. rubber shear pads. These pads absorb most of the throw and vibration from the crusher. The trailer itself is supported by four screen jacks.

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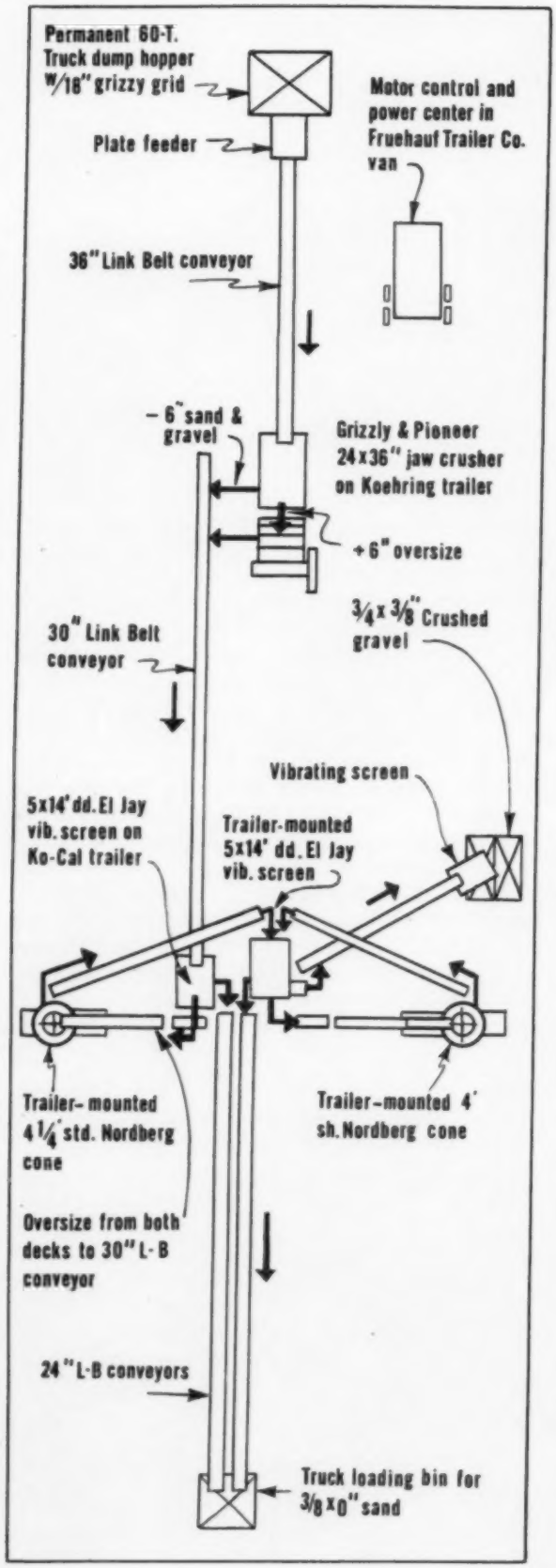
SECOND-STAGE CRUSHING is done in trailer-mounted cone, left, while sand is pulled out from under big vibrating screens



TEAM CAPACITY AND MOBILITY

continued from page 99

Putting the crushers in operation is simplicity itself. After reaching the job-site the jacks are adjusted, power is connected and they're ready to operate.

Versatility was an important consideration. Teichert operates a large paving operation throughout most of northern California. Because of their scope, the plant might be required to produce a number of products from a variety of deposits.

A unitized design provides needed versatility. Each major component is a separate unit allowing plenty of freedom to modify plant arrangement or product flow.

The plant rolls on five 33-ft. heavy-duty trailers, all built to Teichert's specifications, and one 35-ft. stainless-steel van. Three trailers support crushers, while the other two mount 5 x 14 ft., double-deck screens. The van is a self-contained motor control center. An additional flat-bed is used to move the two-section, 60-ton, truck-dump hopper.

The conveyor system exhibits imaginative design work. It consists of 14 self-supporting conveyors ranging in width from 24 to 36 in., with some as long as 70 ft. All have motorized head pulleys and are completely contained within a steel supporting truss for easier handling. The extra depth of truss required to accommodate the conveyor imparts enough additional strength to make intermediate supports unnecessary.

(1) No bolts are required to erect the conveyors. Past experience indicated that plant erection time was considerably increased by the necessity of bolting sections in place. All conveyors are either pin-mounted or rest in saddles welded to supports on the trailers.

(2) All sections over 30 ft. long are hinged in the middle and are folded for transporting. Conveyor sections are carried on flat-bed trailers when the plant is moved.

(3) A short conveyor is permanently mounted within the frame of the chassis supporting the primary crusher. Two additional short conveyors are permanently mounted below the two screens.

The self-contained control and generator van eliminates another erection bottleneck. All plant controls are centered in a 35-ft., stainless-steel van that has been pre-wired to cables with quick connectors. After plant components have been placed, the cables are simply run out from the control center and locked in place. It takes only a few min-

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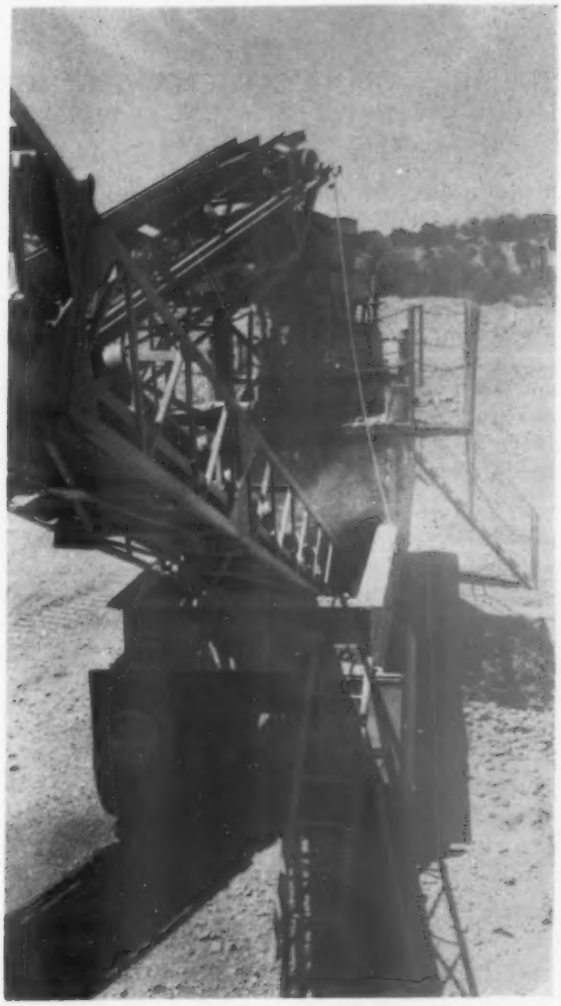
TEICHERT'S POWER PLANT and control center is housed in a stainless steel van. Generators are available to supply standby lights and power



ABOVE: Ingenious design enclosed troughing and return idlers entirely within self-supporting trusses. When the conveyors are moved, the long trusses fold back into a portable package

LEFT: Third-stage crusher on a trailer sends crushed gravel back to a vibrating screen to be sized again

TEICHERT TEAMS CAPACITY AND MOBILITY

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utes to make each connection. The interior of the van is lined with hooks to hold looped cables when the plant is moved. A complete lighting system has been provided since two-shift operation is the rule rather than the exception during peak months.

The plant has always operated where commercial power was readily available so a generator has not been incorporated in the power system. However, two 350-kv. generators are available if needed.

SECRET OF SUCCESS for mounting the ungainly cone crusher is a set of rubber blocks that isolate shear and impact stresses from the trailer frame

TRAILERS AND CONVEYOR FRAMES have conveniently located power receptacles for portable cables from control center

Production has been consistently high. Capacities as high as 700 tph. have been reached in producing minus 1½-in. untreated base material. Even when crushing up to 50 percent, production has usually exceeded 500 tph.

Plant flow is simple and straightforward. Raw feed is dumped through an 18-in. grizzly into a 60-ton truck hopper. This hopper is fabricated in two sections and can easily be moved with the rest of the plant.

A plate feeder drops the material onto a 36-in. conveyor that carries it to a 6-in. grizzly above the primary crusher. Both undersize from the grizzly and crushed material from the jaw crusher are carried on a 30-in. conveyor to the double-deck screen. Oversize from both decks goes to the standard cone crusher. The minus ⅜-in. material passing the bottom deck is conveyed directly to stockpile. If desired, a second product could be made from the oversize from the second deck.

After passing through the secondary crusher, material is conveyed to another 5 x 14-ft. double-deck screen. Oversize from the top deck goes to the shorthead crusher and is returned to the screen. The ¾ x ⅜-in. oversize from the second deck is conveyed directly to stockpile. Another stockpile is fed by undersize from the second deck, a 100-percent crushed material (⅜-in. by dust). If the need arises to make a washed product or to produce additional sizes, there is usually enough spare equipment spread throughout Teicherts' other 10 plants to put temporary facilities together. A completely portable washing plant already is in the initial planning stages. It, too, will be unitized and able to work either in combination with the existing crushing plant or with other units. **END**

MAJOR EQUIPMENT REFERENCE

Dragline, 3 cu. yd.	Northwest Engineering Co.
Quarry haul trucks, 19-ton (2)	Euclid Div., GMC
Truck dump hopper with grid	A. Teichert & Sons
Plate feeder	A. Teichert & Sons
Trailers, 33-ft. (5)	Koehring Co. of California
Van, 35-ft.	Fruehauf Trailer Co.
Dozer	Caterpillar Tractor Co.
Jaw crusher, 24 x 36-in.	Pioneer Engineering Div.
Cone crusher, 4¼-ft. standard	Nordberg Manufacturing Co.
4-ft. shorthead	Nordberg Manufacturing Co.
Screens, 5 x 14-ft. double-deck	El Jay Manufacturing Co.
5 x 8-ft. double-deck	El Jay Manufacturing Co.
Crusher motors, 150-hp. (2)	General Electric Co.
100-hp.	General Electric Co.
Motor control center	General Electric Co.
Conveyor idlers	Link-Belt Co.
Motorized head pulleys	Western Conveyor Co.
	J. D. Christianson Co.

One less variable in the cement-making system lets operators concentrate on other parts of process control

Constant-speed kilns pay off

by Donald L. Derrom*

THIS ARTICLE IS THE FIRST IN A SERIES on practical cement plant operation which I have decided to call Safaris in Cement. The reason is self-explanatory: Safari means an expedition into the interior for discovery or understanding. Drawing upon long experience in cement and other mass-production industries, I intend to proceed in retrograde, starting from the end and tracing a problem back up the stream of production to its solution.

The effectiveness of this method will become apparent as this series continues. It is the key to process interpretation, the basis of production increase and the most important factor in effective cost reduction.

Understanding the dual processing concept of the rotary kiln is of basic importance in the cement industry. An enormous amount of heated air for the endothermic reaction of lime-making must pass through the firing zone without slowing or stopping the more or less exothermal reactions of clinker sintering. The latter, by contrast, requires high temperature protection but relatively low

*Engineer, 1701 Sixteenth St., N.W., Washington 9, D.C.

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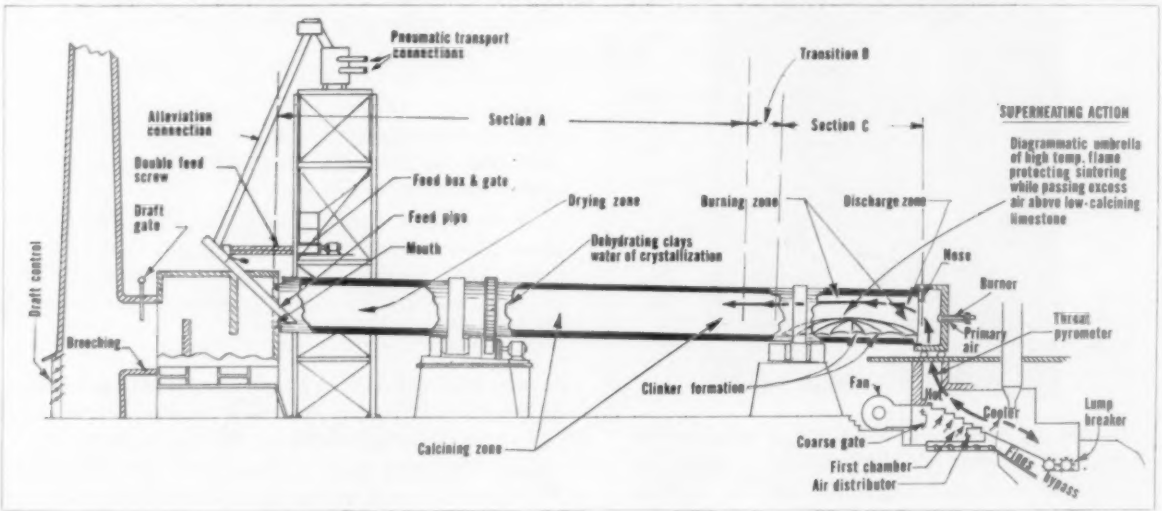
HERE'S AN "IDEAL" KILN showing section where calcining takes place (A), transition zone (B) and sintering zone (C)



Section A Notes

Degrees C.		Degrees F.		
100	Up	212	Up	Range of temp. for drying superficial water
500	600	932	1,287	Range for dehydrating clays and ores
800	1,050	1,472	1,350	Range for calcining $MgCO_3$ pure no. CO_2 press.
600	1,020	1,112	1,900	Range for calcining $MgCO_3$ impure
1,000	1,300	1,832	2,372	Range for calcining $CaCO_3$ pure no. CO_2 press.
800	1,150	1,472	2,134	Range for calcining $CaCO_3$ impure

Importance of knowing exact composition of rock and variations is obvious
Presence of magnesia carbonate in limestone lowers calcination temp.
Heat of decomposition of $MgCO_3$ per lb. is Preheat 329 Btu. + 465 Btu. = 795 Btu.
Heat of decomposition of $CaCO_3$ per lb. is Preheat 329 Btu. + 776 Btu. = 1,105 Btu.

Section C Notes

Degrees C.		Degrees F.			
T_1	T_2	T_1	T_2	Symbol	Range of formation temperatures
-	<800	-	1,472	CA	This action dovetails + zone of A
800	900	1,472	1,652	CS	This action slightly dovetails + A
900	950	1,652	1,758	C_3A_3	More or less true firing zone action
950	1,200	1,758	2,192	C_2S	Full firing zone action
1,200	1,300	2,192	2,372	C_3A	Liquid phase appears
				C_4AF	
1,300	1,400	2,372	2,552	C_3S	Sintering in full swing

Clays and fluxes small in proportion in mix; have wide influence
Fineness needs study; look at the staging in temperatures

CONSTANT-SPEED KILNS PAY OFF

continued from page 103

heat. Thus, the firing zone must be maintained at a higher temperature for clinker formation than indicated in Table 1.

What is not generally understood is that this temperature, higher than the theoretical temperatures given, results in superheating. The clinker transforms its internal structure, alters the physical state of some silicates and stores potential energy. This transformation heat has retroactive effect and introduces a disturbing action. Unless it is used in the cooling of the clinker, it reappears later as the heat of hydration of cement when mixing concrete.

That will be the subject of future safaris. Meanwhile, I advance another concept: Every single factor in the manufacturing process is reflected in the firing zone in one way or another. Constant study and vigilance is the only way to evaluate and control them.

Instrumentation is a great help if the messages are understood; it adds to confusion if they are not. Consistent progress in the direction of automation depends on careful, practical research. Instruments can obey orders but they can't think.

Donald L. Derrom is a consulting engineer in Washington, D.C. He has acquired a wealth of practical cement-making experience in a dozen countries—in Africa, the Near East, Europe, South America, as well as Canada, Mexico and the United States. As a result, he has seen a number of unusual operating conditions and personnel practices. Mr. Derrom also has a great deal of experience in mining, manufacturing and railroad operation which gives him broad insight into cement industry engineering.

TABLE 1.—Formation of various compounds in portland cement

No.	Compound symbol	From T_1 deg. C.	To T_2 deg. C.	Observations
1	CA	?	800	
2	CS	800	900	
3	C_3A_5	900	950	
4	C_2S	950	1,200	
5	C_3A C_4AF	1,200	1,300	Liquid appears
6	C_3S	1,300	1,400	

One fact stands out: The chemists guiding the cement operation have never had a real break. They have had to contend with innumerable variables and oscilliations far in excess of those they themselves produce or control. The conduct of a cement plant, therefore, demands company-wide understanding and cooperation. Every effort must be made to lead the entire staff to understand clearly what goes on and why. This applies not only to supervisory personnel but to operators throughout the process.

Most of the operations in cement making are interlocked. Instruction of personnel should animate the plant organization, create interest and engender cooperation. Precision must be fostered in everything.

Precision is a relative term, guided by tolerances. Thus, progress may be obtained by ferreting out each factor, setting reasonable tolerances, considering how they interlock and trying to improve them by readjustment.

I envision a cement plant that is so handled as to achieve a high degree of precision. And I believe that these "safaris in cement" will show the way to achieve complete automation gently, scientifically and surely.

My first safari will explore constant-speed driving for kilns. This is not a new idea for I first came on it 30 years ago before I had an opportunity to study the firing zone of the rotary kiln and understand what went on in there. I felt that variable-speed driving was the best. Later, I realized that firing zone temperatures have no direct relation to the end product.

I was encouraged to think in the direction of constant speed by many authorities and, finally, by Hubert Woods of the Portland Cement Association. All I needed was the opportunity to try it.

The opportunity came in 1954. Our plant had

Please turn to page 108

Only Spencer uses military type underwater tests to determine the relative effectiveness of commercial explosives. These tests are the latest in a continuing research program conducted by Spencer Chemical Company, the pioneer supplier of solid ammonium nitrate as an ingredient in blasting.

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60% Gelatin Dynamite	384	84	372	1,800

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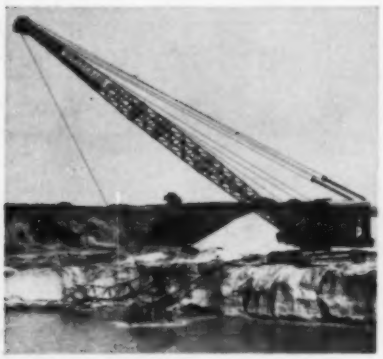

Tuffy Balanced Dragline Rope

Tuffy Balanced Scraper Rope

Tuffy Balanced Dozer Rope

Helicopters, long noted for their disaster missions, are becoming "work horses" in the air. Equipped with wire rope and slings they pick up and set materials and machinery down in inaccessible places and carry hurry up loads to otherwise easy to get to places. Photo courtesy Bell Helicopter Corporation, Ft. Worth, Texas.

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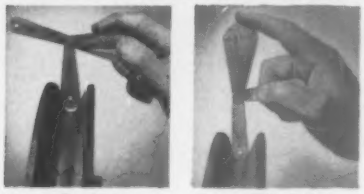
Tuffy Wire Rope Tips

Money-Saving Ideas on the Use and Care of Wire Rope

How to Check Groove Diameter



Not Quite — Just Right

Groove diameter of a sheave or drum must never be less than the actual calipered diameter of the new rope. When a new rope is installed on old equipment, use a reliable groove gauge to make sure the tread or bearing surface of all sheaves is of sufficient size to avoid pinching the rope.

Recommended Sizes

Diameter of Rope	Min. Dia.	Max. Dia.
¼-⅝	+ 1/64"	+ 1/32"
¾-⅞	+ 1/32"	+ 1/16"
1-1⅛	+ 3/64"	+ 3/32"
1¼-1½	+ 1/16"	+ 1/8"
1⅝-2⅛	+ 3/32"	+ 1/16"
2⅜ and larger	+ 1/8"	+ 1/8"

New ropes are usually oversize. It is advisable to have groove diameters of sheaves or drums as large as the actual calipered diameter of the new rope, or slightly larger.

Use the Right Fittings

Right fittings add life expectancy to wire rope. Fittings which derive holding power from crimping action are harmful. Shown here is a clamp that has no "wrong side"—can be put on either way. It snugly saddles the rope, grips larger surfaces in such a way that loads are carried almost entirely by friction instead of crimping action. Combined in its two parts is a thimble. The parts are interlocked to prevent collapse of the thimble, and eliminate all shear on the bolts.

Would you like a copy of a booklet in which more than a score of Tuffy Tips like those above are reproduced. If so, write Union Wire Rope Corporation, [illegible] Manchester Ave., Kansas City 26, Missouri.

Tuffy Balanced Slings and Hoist Lines

UNION Wire Rope

4-C

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CONSTANT-SPEED KILNS PAY OFF

continued from page 104

TABLE II—Constant speed data of kilns reaching 54,059 hr.

Kiln	Shell diam.	Diam. bricked	Length ft.	Volume cu. ft.	Chimney data	Ramp incline, in. per ft.
A	8 ft.	7 ft.	125	4,810	separate	3/8
B	8 ft.	7 ft.	150	5,775	shared	1/2
C	8 ft.	7 ft.	135	5,175	shared	1/2
D	10 ft.	9 ft.	175	11,090	separate	3/8
E	10 ft.	9 ft.	175	11,090	separate	3/8

TABLE III—Hours of kiln runs on constant speed

Kiln	Date begun	Order of start	Date timed	Hours run	Remarks
A	9/13/55	4	1/9/57	6,572	This kiln underwent heavy reconstruction
B	6/3/55	2	1/9/57	9,062	This kiln was used to guide setting
C	11/3/54	1	1/9/57	11,539	This kiln was the guinea pig
D	5/25/55	3	1/9/57	8,059	This kiln needed some realignment
E	5/25/55	3	1/9/57	9,827	Made good run
				45,059	

five kilns, only two of which were identical. This assured us less chance of being misled than if all had been equal. The work I am about to describe covered three years and resulted in 45,059 hr. (5.36 kiln yr.) of constant-speed running.

This was a period of rehabilitation, during which there was much downtime. Yet in the final year, production increased by 23,000 tons and fuel use dropped five percent during practically the same number of kiln hours as in the first year.

Table 1 gives details of the kilns' characteristics (For results see Table 2). They were not all put on at the same time. The first was Kiln C which had been down for general repairs and cooler modification. The variations, however, gave a wonderfully useful set-up for studying how to accomplish the change desired. Before the operation was completed, the entire organization knew a lot more about kilns, how they worked and how to treat them.

It was not an easy matter to bring about this change. First of all was the personnel resistance to progress. The lucky thing that broke the ice happened when Kiln C started up after some repairs. It ran for a short time on the old system, then the kiln motor konked out and there was no equivalent spare. An expensive motor, it was sent for repairs under rush orders. Three different outfits failed to repair it.

Meanwhile we had to shut the kiln down or apply a common ac. constant-speed motor. If we shut the kiln down, jobs would have had to be cut. Most people were skeptical about the success of such a move, but the invested authority was sufficient to force the issue. We won out.

It was not an easy job, but there was no sure evidence of impossibility. Very early all became interested and enthusiastic in cooperating to get it on the beam. It turned out to be fun.

In the process we all learned a lot about how not to operate a cement plant in general and a kiln in particular. Table 3 gives details of the run, up to the end of 1956, and shows how one kiln after the other was put on constant speed and continued so.

We were dumbfounded at the amount of detail we had to ferret out, clean up and put into service to make things successful. In spite of much tinkering, cutting, trying and stopping to modify, we lost no production; rather, we increased it steadily.

Running on constant speed puts the whole plant and organization on its toes. Out goes the old lackadaisical peeking up the kiln, seeing nothing useful that an instrument couldn't do better, and tinkering with the controller. Constant speed pulls everyone (and everything) into his proper place and develops foresight, fosters attention and gives confidence in the instruments. Pet theories and mannerisms give place to common sense, and all shifts are pulled into line; they must continue the set policy.

Once set, speeds were locked so that no change was possible. This is one of the musts. As we progressed from point to point, the job became easier to control. Statistics and figures began to take on meaning. We governed the operations by daily meetings where all phases came up for scrutiny, suggestion and action. The whole organization was in on it.

A list is herewith included of the many factors taken care of as the work went on. It should be understood that once starting a kiln on constant speed, we never went back to variable speed. Such action was never proposed.

Here is a partial list of steps taken in putting kilns on constant speed:

1. Inspected every possible detail of Kiln C before starting; cleaned all for a fair start.
2. Cleaned and calibrated all instruments.
3. Checked and put in order all riding rings, rollers and thrust rolls.
4. Verified the fuel meter.
5. Took account of the fact that the kilns had

Please turn to page 148

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A single pump handles the output of two clinker mills
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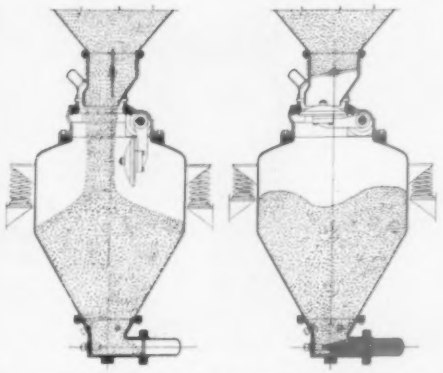
for—400 feet horizontally
and—110 feet vertically
with—230 horsepower!

Cement Plant—
Clinker Grinding Section

One pump handles the output of one clinker mill
conveying—105 barrels per hour
through—a 4" standard pipe
for—1000 feet horizontally
and—70 feet vertically
with—100 horsepower!



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Michigan's primary job: cleaning around two 6-yd shovels, usually spotted 1,500 to 1,800 ft apart.

Typical Michigan odd-job: centrally stockpiling oversize rock chunks for secondary breakage.

To clean and pile average 40,000 ton blast takes the high-speed 56,000 lb Michigan only half a day.

Job-to-job moves are made at truck-like speed. Unit's tires roll easily over the rocky footing so abrasive to tracks.

One 262 hp Michigan Dozer does work of two big crawlers: cleans around two 6-yd rock shovels, also piles blast rock at Huron Portland Cement Company quarry. A typical saving:

60% CUT IN SHOVEL CLEANUP TIME

At least three important savings have been realized by the Huron Portland Cement Company quarry, Alpena, Michigan, since their 262 hp Michigan Tractor Dozer took over pit maintenance duties.

ONE, the Model 280 Michigan Tractor Dozer and its one operator do the work of two 28,000 lb class crawlers and two operators.

TWO, Michigan tires have eliminated annual or bi-annual track rebuilding. Tires on the Model 280 are expected to last "about twice, maybe three times as long as tracks," say men on the job... an estimate based on the quarry's three-year experience with a smaller (162 hp) Model 180 Michigan Dozer, recently moved from the quarry to the company cement plant.

THREE, the Michigan, with its high speed and power, saves time on almost every individual cleanup chore. To be sure, this saving may be only 2 to 5 minutes per job . . . but added up over 6 days a week, 52 weeks a year, the sum total makes an important contribution in more loads delivered, quarry face to crusher grizzly.

For instance, take the saving in shovel cleanup. Back in Huron Portland's crawler days, a good operator could clean the spillage around one shovel in 5 minutes. While the crawler dozed, the 6 yd electric shovel couldn't load (primarily because its power cable blocked one side). Today, the shovel still cannot load during cleanup. But the high-speed Michigan does each cleanup in 2 minutes! Thus, 3 minutes are saved. Three minutes saved, 8 to 12 times a day, *at each of Huron-Portland's two 6-yd electric shovels.* That's 5 to 7 extra 26 to 27 ton truck loads *from each shovel* each day—260 to 360 extra tons of stone each day for the crusher (and the cement plant).

75% cut in blast cleanup time

Another example of time saved is in blast cleanup. One to four times a week, Huron-Portland's crew shoots the 100 ft high quarry face. Each blast breaks up 35,000 to 45,000 tons of limestone. Trouble is, some rock gets thrown 100 to 200 feet, sometimes 300 ft. Used to take a crawler one to two days to police the area and gather all the rock. Now, the Michigan Tractor Dozer does the policing job in half a day. (Here is one place the 262 hp Michigan Model 280 noticeably outperforms the 162 hp Michigan Model 180 used so successfully for three years. The bigger Model 280 can move heavier rock . . . can often do in two passes what took the Model 180 four passes . . . and it can pile the rock several feet higher.)

Stockpiles oversize rock . . . biggest chunk moved, 16½ tons

Being the only *mobile Dozer* in the 450 acre pit means the Michigan does lots of odd jobs too. It moves drilling machines, air compressors, and shanties. It cleans spillage from the 2,000 ft of shovel-crusher haul road. Cleans around the crusher. Drives a mile to the cement plant to stockpile coal, when necessary. Moves power cable for the shovels. In winter, it keeps roads and building areas free of snow. It even moves oversize rock chunks away from shovel for secondary breakage. Biggest rock chunk dozed by the Model 280, to date, measured 4x5x10 ft, weighed about 33,400 lbs.

Check performance on your job

We'll bet a Michigan Tractor Dozer can break production bottlenecks for you, too. Won't cost you a cent to find out—your local Michigan Distributor will be glad to arrange a thorough demonstration. You pick the time . . . the job . . . and the model Michigan Tractor Dozer (162, 262, 375, or 600 hp) you want to see. No obligation, of course.

In 5 years, 1¼ yd Michigan loads 450,000 yds of rock. Yet...

REPAIR COSTS TOTAL $82.85

In studying most efficiency reports, you have to remember one extremely important fact: that the data given usually cannot legitimately be applied to machines now available. Changes galore—for good or bad—have been made since the veteran unit was built. That is why this report seems to us so significant. The Michigan Tractor Shovel described is in every important component EXACTLY like the Michigans made today. In fact, all 12,000 Michigan Tractor Shovels built have been like the first one—a tribute to the efficiency of design and efficiency of their all-Clark designed and built power trains.

For the past five years, Yaquina Head Quarries, Newport, Oregon, has used this Model 75A Michigan Tractor Shovel 6 to 8 hours a day, 5 days a week, truck-loading crushed rock. The machine has handled over 450,000 yards of material, ranging in size from ¼" to 4" minus.

Its only downtime in all these months has been for changing points and plugs, and for replacing two brake cables, two hydraulic hoses, and the bucket edge.

The work took less than six hours and parts cost exactly $82.85.

For this superb record, credit belongs partially to excellent machine design and construction . . . partially to Plant Supt Virgil Landess' insistence on a simple, regular, preventive maintenance program. The Michigan is greased every day. Rear end and torque converter are checked twice a week. Oil is changed every 40 hours, filters every 80 hours, and a one-hour maintenance check made every two weeks.

"Cheap insurance for keeping an excellent machine excellent," says Quarry Owner Roy Sawyer.

Stock-piles at the Yaquina Head quarry are located in a quarter-mile semi-circle around the crusher, on two levels. Good brakes, excellent visibility, 26 mph speed, fingertip power steering combine to cut travel time between loading locations.

Material—after shooting, secondary shooting, crushing, and normal 2½-to-1 swell—weighs 2600 to 2800 lbs per yd. Mostly basalt, tests show a very small percentage of iron in the rock. Assays have picked up gold, too—80c worth per ton.

Steep 20% grade between stockpile levels proves no problem for the powerful four-wheel-drive Michigan—even in wet weather.

Among the many odd jobs done by Yaquina Head's quarries mobile Michigan Tractor Shovel: moving a 4,000 lb crusher head.

Loads typical truck in one minute

The 80 hp Michigan speeds all kinds of scattered assignments. It lifts crusher heads, for example. Picks timbers. Sets motors. But mostly it loads trucks. "Everything from pickups to 15 yard semis with 8 ft high sides," describes Owner Sawyer. A typical 5 yard truck is loaded in four bucket-fulls. Time: 1 to 1½ minutes.

Reduces truck waiting time 80%

Fast loading—plus fast travel between the nine stone stockpiles—has cut truck waiting time to practically zero. "In the old days—when we handled loading with a ¾ yard rubber-tired machine of another make—trucks often had to wait 10 to 15 minutes each for loading service," remembers Mr. Sawyer. "That old machine couldn't load out more than 250 yards a day. Our Michigan easily loads 400 to 500 yards a day. And it *has* loaded as much as 835 yards (in 8 hours)."

Eight models now available

How do your production requirements compare? If they're the same (or less), your most economical bet for the job probably would be a Michigan 1¼ yard all-wheel-drive model (like the machine described here). For greater output, you have a wide choice of bigger machines: with 1¾, 2, 2¾, *and the new 4 or 6 yard buckets* (standard SAE measure). For clean-up around crushers and belts, there's a 16 cubic *foot* size and a 1 yard size. Eight standard models in all. See your Michigan Distributor for details.

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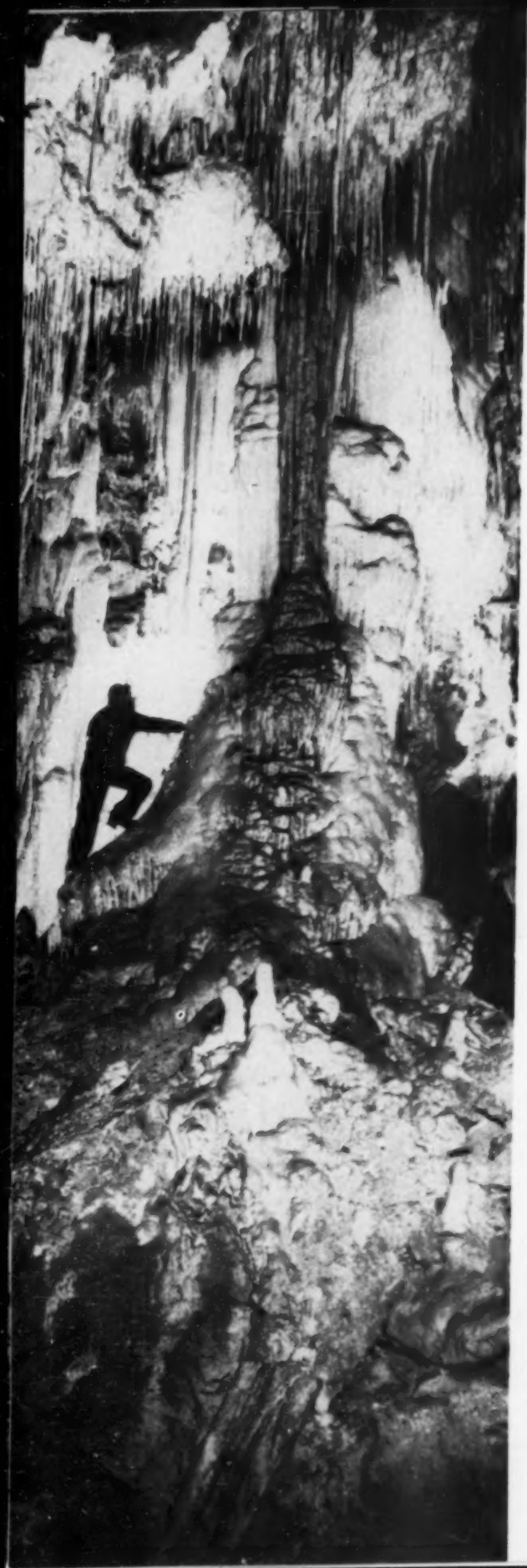

Can nature's methods be adapted for mining pure calcium carbonate from underground deposits?

Here's a test-tube approach to lime production

by A. A. Mayling*

A NEW CHAPTER IS BEING WRITTEN in the annals of mineral production under the heading, "Chemical Mining." The ink is hardly dry on the first pages because the principles are still being tested. As a chemist, I think the idea is practical, and have worked out a method for chemical mining of limestone. You might call it a test-tube approach to lime production. It has this advantage over other methods: when you are finished taking what you want from a deposit, you can leave the rest of the rock in the ground where you found it.

Like all discoveries, this one of mine is directly traceable to necessity. Needing a relatively pure type of limestone for a lime neutralization process, I was in an area where the deposits contained too much silica or other components. I had to buy stone from such a distance that more than half the cost was that of transporting it. If I were to use the 60 to 70-percent calcium carbonate limestone in our area, I would have to devise a method to separate it from undesirable constituents.

A solution-mining technique was the answer. From results of laboratory experiments, I have concluded that all you need to do to mine lime

Please turn to page 116

*Chief Chemist, Denison Mines Ltd., Elliot Lake, Ontario, Canada

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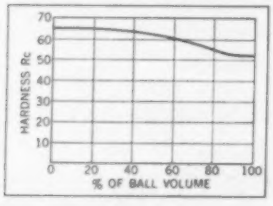

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A TEST-TUBE APPROACH . . .

continued from page 114

■ *This article may point the way to an entirely new approach to extracting high-grade minerals from low-grade or inaccessible deposits . . .*

chemically is to insert a pipe into a bed of stone to feed in carbon dioxide and water, along with an exit pipe for the calcium acid carbonate solution produced. Selection of appropriate temperature and pressures should lead to the continuous production of pure calcium carbonate from an impure limestone for a relatively low cost.

All my laboratory work was in the nature of a preliminary investigation, and all the initial scouting was carried out with convenient available equipment. I used a one-liter florence flask fitted with a two-hole rubber stopper. One tube from the latter led into a water and limestone slurry; the other vented to the air. Carbon dioxide passed from the cylinder through a wash bottle into the slurry and then to the air. The slurry was kept agitated with a magnetic stirrer, and the valve on the cylinder was adjusted to give a slow bubble rate of gas through the wash bottle.

The reasoning that led to this process was as follows: Limestone country is characterized by caves formed by the action of water containing carbon dioxide. Calcium acid carbonate resulted from the action of carbon dioxide and water upon the calcium carbonate, according to the equation:

$$CO_2 + H_2O + CaCO_3 = Ca(HCO_3)_2$$

Stalactites are usually attributed to the evaporation of calcium acid carbonate. Therefore, I decided to obtain a figure for its solubility. This involved preparation of a strong solution of potassium acid carbonate and mixing it with a strong solution of calcium chloride at 32 deg. F. The mixture was filtered and the filtrate analyzed. It was found to contain calcium acid carbonate equivalent to 10.4 g. calcium carbonate per liter. This figure, I realized, would only approximate the solubility of the chemical. Then, I knew, too, that the salt may have a greater or less solubility at a higher temperature.

A slurry of the ground limestone was left stirring while carbon dioxide was passed through the mixture. A sample was taken after one hour, filtered and the filtrate analyzed. It now was found to contain calcium acid carbonate equivalent to 1.0 g. calcium carbonate per liter. The same figure was found after the experiment continued overnight.

I concluded that the rate of formation of calcium acid carbonate was equivalent to its rate of decomposition at ambient temperature and one atmosphere pressure, and the amount formed was proportional to the solubility of carbon dioxide under the conditions of the experiment.

The law of mass action shows that the greater the amount of carbon dioxide that can be dissolved, the larger the concentration of calcium acid carbonate, because the active mass of calcium carbonate is practically zero and that of water is constant. Solubility of gases is proportional to the pressure; so, at 10 atm. (150 psi.), the concentration of calcium acid carbonate should equal its solubility. Release of pressure will deposit a pure calcium carbonate, and elevation of temperature should achieve the same end.

Now, to apply these principles to limestone mining. As I said earlier, all that appears to be necessary would be to insert a feed pipe into the bed to feed in carbon dioxide and water, and an exit pipe for the calcium acid carbonate solution produced. Selection of the appropriate temperature and pressures should lead to the continuous production of pure calcium carbonate from an impure limestone for the cost of pumping 100 to 150 tons of water and a little more than one-half ton of carbon dioxide for every ton of calcium carbonate produced. There also would be such heat losses as would occur from conduction in the limestone bed—if it were found necessary to operate at an elevated temperature. Losses of carbon dioxide could be made up from scrubbed flue gas.

It seems probable that a mining operation using these principles could produce calcium carbonate and magnesium carbonate as separate entities from a dolomite ore. This is indicated by the difference in solubilities and stabilities of calcium acid carbonate and magnesium acid carbonate. Such differences have been observed in separating these components from carbonate deposits in a water-softening operation. Other carbonate and oxide ores, as well, should be considered for this mining process.

My own practical application of these deductions was cut short by research work on our operation in which lime neutralization was made unnecessary. I therefore abandoned further work on lime production, but offer these thoughts in the hope that they will be of value to others interested in the production of lime. **END**

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BUCYRUS-ERIE

Report to business from B.F.Goodrich

World's longest conveyor belt system . . .

Takes rocks roller-

B.F.Goodrich belts shoulder 1000-ton-an-hour loads on long trip to cement plant.

OVERHEAD are tons of rock roller-coastering 5½ miles across the Oklahoma countryside. The rubber highway they ride is a record-length conveyor belt system that delivers quarried limestone to a big cement plant at a 1000-ton-an-hour clip, and does it more economically than any other type of hauling.

A few years ago a long-distance conveyor like this couldn't have been built. Belts weren't as strong then, couldn't carry heavy loads so far. A haul like this would have taken too many belts, cost too much.

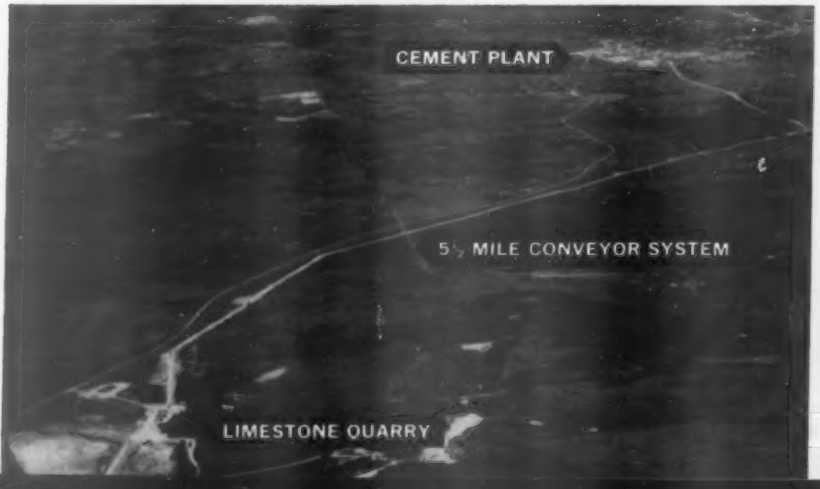
Then B.F.Goodrich engineers found a way to add extra muscle to a belt without making it thick and stiff. A special fabric, called Nyfil, built into the rubber, makes it so strong a single belt can now cover distances that used to take three or four belts. One BFG belt in this spectacular overland system actually spans 2.2 miles—*the longest ever built* in the U.S.A., more than twice as long as any other in use today.

If you have to move something—cross country or across a plant—we have many kinds of belting and hose to carry it, and vinyl pipe to pipe it. For help with a materials-handling problem, or for more information on any rubber product BFG makes for industry, call your B.F.Goodrich distributor, or write *B.F.Goodrich Industrial Products Co., Dept. M-904, Akron 18, Ohio.*

B.F.Goodrich

START OF CROSS-COUNTRY RUN for conveyor system. It arches over two highways, two railroads, tunnels under 6 cattle crossings on way to cement plant.

coastering 5½ miles



IDEAL'S TRANSPORTATION system spans 5½ miles of rolling countryside. BFG belt-road delivers 1000 tons of limestone an hour from quarry to Ideal Cement Company's big, modern plant at Ada, Oklahoma. One of seven sections in conveyor covers a distance of 2.2 miles—the longest single belt in the United States.

Single-belt system puts heavy aggregates into riverside storage

Conveyors speed Ohio River lock construction

NORMALLY, A CONVEYOR SYSTEM is not called upon to handle many aggregate sizes. The capacity and strength engineered into a system are determined by the fairly uniform characteristics of the material it handles. But under no such limited category is a conveyor system that meets this extraordinary challenge: to handle five sizes of construction aggregates, from fine sand to 6-in. crushed stone. And it does so, moving each to stockpile or station with the aplomb and dexterity of a poker player dealing out a hand.

The conditions creating this unusual use of conveying equipment exist near Chilo, Ohio, where Standard Materials Corp. and Ohio River Stone Co. ship aggregates for use in the Capt. Anthony Meldahl Locks & Dam project. About 1¼ million tons of limestone, sand and gravel are required for production of the 670,000 cu. yd. of concrete being used in the project. Ajax Towing Co. of Minneapolis, Minn., transports these materials, loaded into barges by Standard Materials Corp. and Ohio River Stone Co., to the jobsite. Groves-Ventures Co. unloads at the rate of about 5,200 tpd.

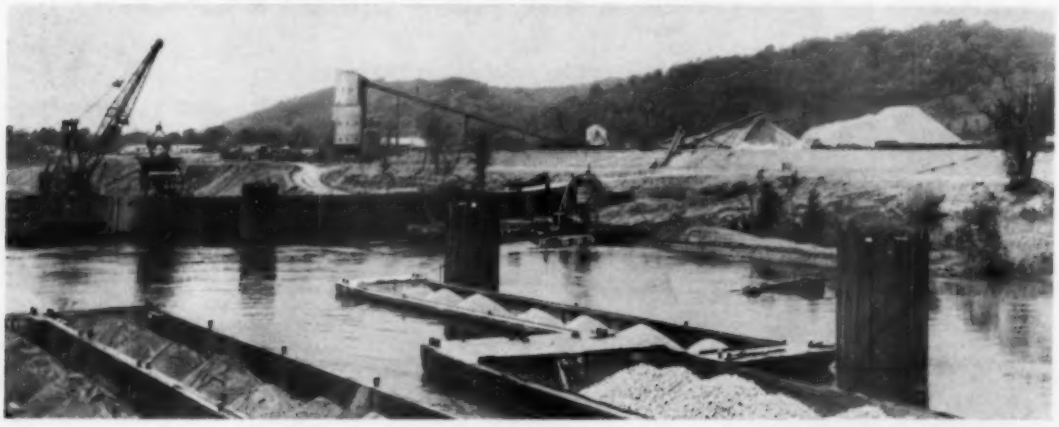
The aggregates have three different points of origin. From Prospect, Ky., comes crushed limestone in the 3 to 6-in. size, but this material sometimes contains oversize up to 9 in. Crushed limestone ranging from 1½ to 6 in. is also brought from Madison, Ind., as well as ¾ x 1½-in. crushed limestone. Aggregates from Bellevue, Ky., include No. 4 to ¾-in. gravel as well as concrete sand.

The single belt conveyor system, equipped with a radial stacker and a traveling tripper-stacker, was installed to handle this flow of materials. Here, low cost and convenience were major considerations. Sand, gravel, crushed stone—whatever the load—is moved from the dock to storage, reclaimed, and sent to the concrete batch plant on this one system.

Here is how the materials-handling system moves aggregates from barge to stockpile: A towboat brings the barges from their tie-up moorings, jockeying them into position alongside a crane that has a 5-cu. yd. clamshell. Pockets of material that escape its big jaws are cleaned up by a front-end

Please turn to page 122

STANDARD 850-ton barges snug up to 1,350-ton barges of minus 14-in. crushed stone at the new Meldahl locks



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UNIT extra long crawlers and wider axles and shoes provide perfect balance, too. Stability is superior . . . you can work faster without continuous tipping on long or low boom work.

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Your UNIT dealer has full information on ½ to ¾-yd. draglines, fully convertible to other front ends. See him soon for the full UNIT story.

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SHOVELS: ½ to ¾ YDS. • **HOES:** ½ to ¾ YDS. • **CRANES:** 5½ to 40 TONS • **DRAGLINES:** ½ to ¾ YDS.

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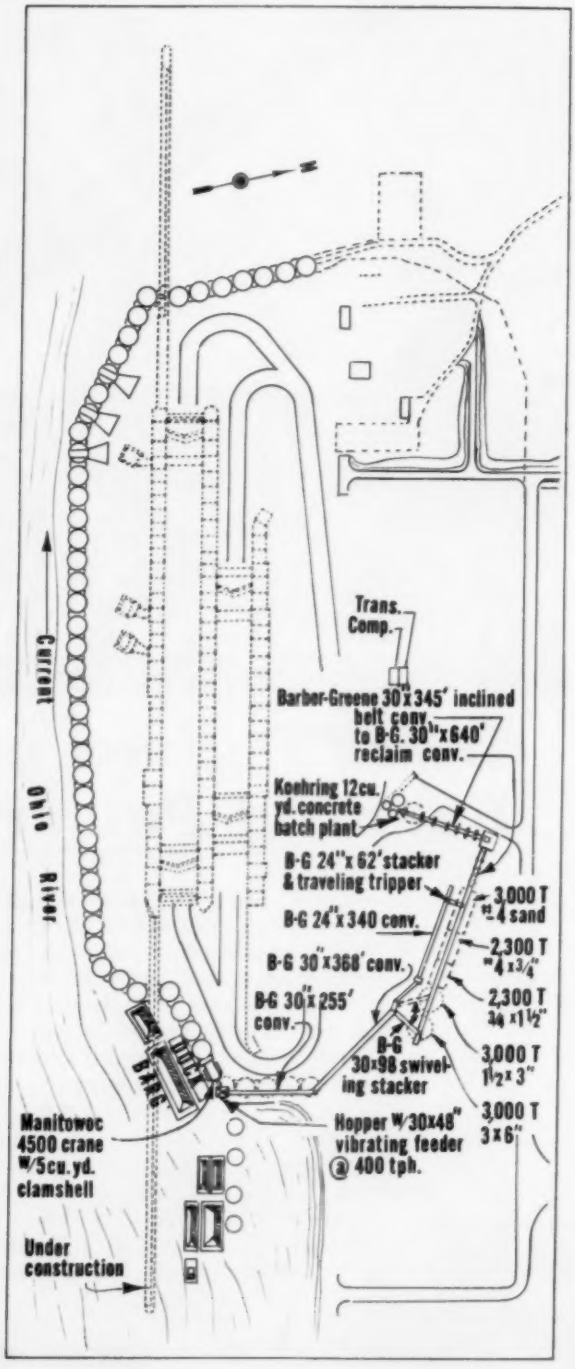
AGGREGATES ON THEIR WAY from barge to storage at the big Groves Ventures' project



LAST CONVEYOR in the system leaps from the rinse house to the top of the concrete batching plant

CONVEYORS SPEED OHIO RIVER LOCK CONSTRUCTION

continued from page 120

loader that the big clamshell picks up and lowers into the barge on a sling.

The crane discharges into a steel receiving hopper at the end of the dock. This was designed originally as a below-grade hopper for the bottom of a truck dump. That was in early stages of planning, when all aggregates but the heaviest sizes where expected to be brought in by truck. A switch to dock use was negotiated by adding a frame to hold the hopper. It has a 30 x 48-in. vibratory feeder that discharges 350 to 400 tph.

Aggregates discharged by the feeder fall to a long belt conveyor that carries them over a cofferdam to the bank. A second long conveyor then moves the material to the storage area.

The low silhouette of the conveyor trusses may seem surprising; however, they were first used in the West Virginia-Pocahontas coal fields. Designed to accommodate the limited clearance in mine tunnels, they first served underground and were reconditioned for their present use.

To become serviceable in handling their present assignment, the conveyors were equipped with standard, three-rolled troughing idlers. The balance of the system features new, permanently lubricated, carrying and return idlers.

From the storage center, material can be chuted to one of two conveyors. One is a self-propelled radial stacking conveyor 98 ft. long that builds conical stockpiles of 3,000 tons for either the 1½ x 3-in. or the 3 x 6-in. stone.

Finer material is chuted to a supplementary conveyor and carried to a single-wing stacker. This is a ground-mounted unit 340 ft. long. At its receiving end, there is a horizontal gravity take-up. The single-wing tripper and stacker, rail-mounted, has a total travel of 260 ft., and the stacker itself is 62 ft. long. It makes three elliptical stockpiles for storage of 3,000 tons of sand, 2,300 tons of ¾-in. stone and 2,300 tons of 1½ x ¾-in. material.

The operation here is supplemented by a bulldozer that stockpiles additional material. This is sufficient to sustain a 10-day production of concrete at the current pouring rate of 2,500 to 3,000 cu. yd. per day.

A TRAVELLING TRIPPER-STACKER builds stockpiles of sand and small aggregates along a 340-ft. distance

The reclaim system originates beneath the string of conical and elliptical stockpiles. The reclaim tunnel runs directly beneath them, receiving aggregates as needed from 18 gates and a feeder. Four of the gates are manually operated—two each in the 18 x 18 and the 24 x 30-in. size. The remaining 14 are air-operated, 18 x 18-in. gates.

The only vibrating feeder in the reclaim system is 42 x 70 in. It is mounted beneath the stockpile of 3 x 6-in. stone. All gates and the vibrating feeder discharge onto the gathering belt in the tunnel below. About 480 ft. of this belt is within the tunnel; the remaining 169 ft. ascends above ground to take aggregates to the rinse house. Everything but sand is washed.

As material passes over a vibrating screen in the rinse house, the fines pass through the bottom deck and are carried to the waste pit. The balance moves to the concrete batch plant on a 30-in. x 345-ft. belt conveyor.

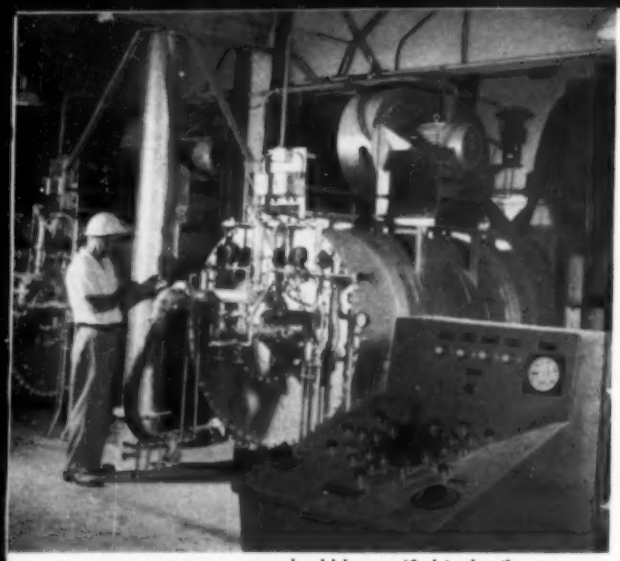
This is a typical mix in the concrete batch plant:

6-in. rock	4,671 lb.
3-in. rock	3,042 lb.
1½-in. rock	1,738 lb.
Fine rock	1,412 lb.
Sand	2,636 lb.
Cement	1,043 lb.
Fly ash	262 lb.
Water	613 lb.

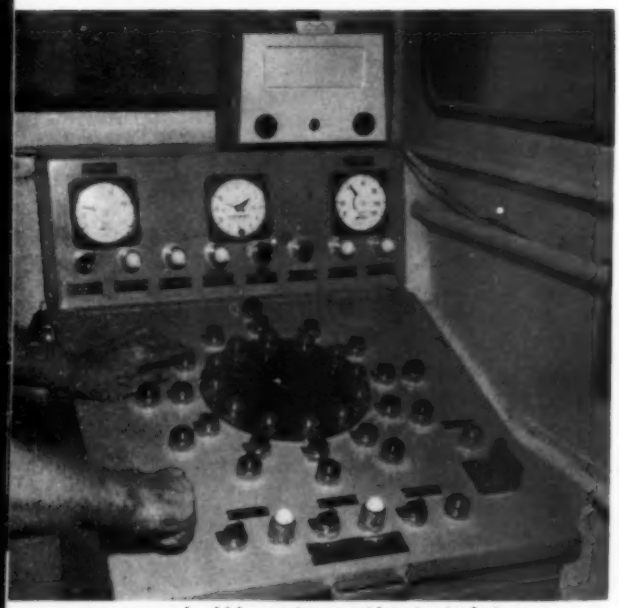
There are three mixers, each with 4-cu. yd. capacity, that produce a total of 15,417 lb. of concrete in each batch.

When the Capt. Anthony Meldahl Locks & Dam project is completed in 1961, it will slip into place like the last gigantic piece of a jigsaw puzzle. It is one of four such projects which will open 350 miles of river to more efficient navigation. Lockage time will be reduced from 10½ to 1½ hr. by the four modern, high-lift dams. The impressive river improvement project is under the direction of the U. S. Army Corps of Engineers, Huntington District. The project is being constructed by Groves-Ventures Co., Minneapolis, Minn.

The conveying equipment was supplied by Barber-Greene Co., and the 5-cu. yd. clamshell crane was manufactured by the Manitowoc Engineering Company, Manitowoc, Wis. END



INSPECTION PROCEDURES should be specified in detail



SIMPLICITY should be a prime consideration in design

A "SAFE" INSTALLATION with guards and railings in place

Part 1

Here's a list of commonsense suggestions for electrical safeguards

How to check electrical hazards

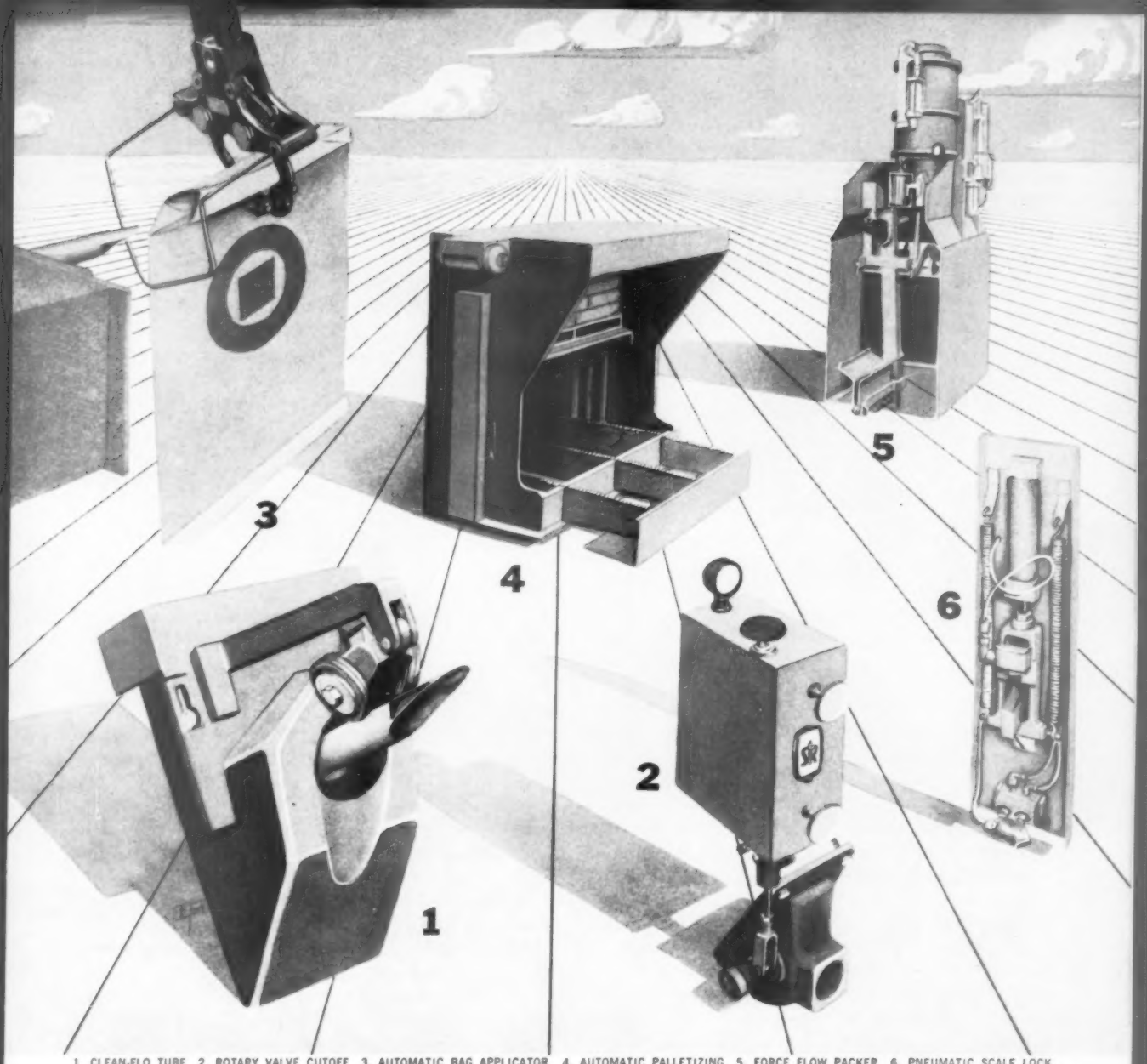
by R. F. Schoof* & T. F. Bellinger†

SAFETY IN ROCK PRODUCTS PLANTS has improved steadily over the past several years, thanks to new equipment and physical arrangements that have an ever-increasing degree of safety built into them. But you can't guarantee safety for men and machines simply by using every machine and personnel protective device possible. Safety is achieved by providing maximum physical protection, by removal of hazards and by indoctrination and training of all personnel in safe operating practices.

This three-part series of articles is aimed to fill the need for more information on the selection, use and maintenance of modern machinery in the rock products industry. In Part I we will be concerned principally with electrical protection of employes by providing good working conditions. Part II will discuss how safety for machinery protects your investment and Part III will take up maintenance requirements of protective devices and an adequate plant power system.

Many safety features that now are standard were once part of local and state codes—emergency stops, lockouts, protected stairways, working platforms and the like. Codes, however, are generally a minimum standard; the safety of specific installations can be further improved without major additional cost. *Please turn to page 128*

*Safety Services Section, Allis-Chalmers Manufacturing Co.
†Electrical Control Dept., Allis-Chalmers Manufacturing Co.



1. CLEAN-FLO TUBE 2. ROTARY VALVE CUTOFF 3. AUTOMATIC BAG APPLICATOR 4. AUTOMATIC PALLETIZING 5. FORCE FLOW PACKER 6. PNEUMATIC SCALE LOCK

St. Regis® takes 6 giant steps to improve cement packaging

Two years ago, St. Regis surveyed the cement industry to find what major improvements were being sought in cement packaging. Here are the results of our progress to date to give industry officials an answer to their six most important packaging problems.

1. CLEANER BAGS – The Clean-Flo® Filling Tube for the 150-FC Packer (proven in actual field use). 2. IMPROVED WEIGHT ACCURACY – New Rotary Valve Cutoff for 107-FC Packer for better weight accuracy, cleaner bags and automatic discharge. 3. AUTOMATIC BAG APPLICATOR – Installed at St. Regis Bag Testing Laboratory, first performance tests have been successful. Field installation due late 1960. 4. AUTOMATIC PALLETIZING – Industry's first automatic palletizing system now operational. 5. PACKAGING EQUIPMENT—The St. Regis Force Flow® Packer, now under field testing, packs all cement products equally well with better weight accuracy and cleaner bags. 6. REDUCED MAINTENANCE—Pneumatic Scale Lock provides a simpler scale locking system, reducing dust and spill.

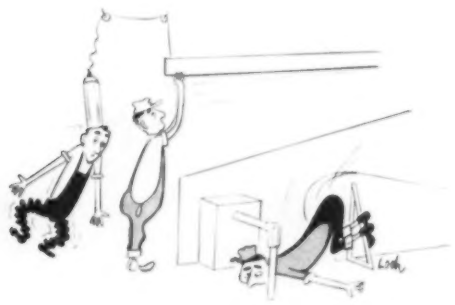
These and other outstanding developments are only part of St. Regis' search for answers to packaging problems–present and future–of the Cement Industry.

This is St. Regis *Packaging-in-Depth* in action – a complete bag service available from 13 manufacturing plants and 33 sales offices across the country.

Packaging-in-Depth by BAG DIVISION **St. Regis** PAPER COMPANY

HOW TO CHECK ELECTRICAL HAZARDS

continued from page 126



HAZARDS lurk in work areas that often appear safer than they really are. Here, the incoming electrical conduit is directly in the walkway; brace for the belt guard, although a good idea, is bent outward into aisle rather than inward where it would be out of the way. Counterweight for vibrating screen enclosure should be enclosed in tube extending all the way to the floor

Standard electrical safety features should be investigated first when a new project is in the planning stage. For example, devices like the third overload on a three-phase system are available at nominal cost. They provide additional protection against single phasing even on grounded wire systems where their use ordinarily would not be mandatory. Similarly, use of time delay undervoltage protection, while providing a measure of convenience and continuity, should be checked thoroughly for possible problems of system overload on a multiple restart.

Besides the standard electrical protective devices built into rock processing equipment, a considerable array of special ones is available. Some can be applied to existing installations; some must be installed when the unit is under construction at the factory. In either case, the cost of these devices must be equated to two distinct factors: (1) lowering of direct and indirect accident expenses by improving the inherent safety and (2) possible lowering of labor costs by performing operations automatically.

Personnel safety has varied approaches. Much can be accomplished by improving working conditions. In the early stages of design, this is accomplished by building the plant around the machinery, or sometimes by fitting the equipment into an existing building. Either method can provide the desired results when such factors as lighting, machine arrangement, access walks and stairways, dust control, ventilation and emergency exits are considered.

Dust control equipment can measurably improve conditions, resulting in a higher standard of work and a decrease in accidents. These come about through increased visibility and recognition of hazards, improved footing, lessened fatigue and the fact that the workman's attention is better directed toward the job without preoccupation with undesirable conditions.

Emergency stop devices are basic in equipment that uses inrunning feedrolls with pinch points. Trip bars and trip wires that actuate limit switches have worked satisfactorily in many plants and their maintenance expense is nominal. Where distances are great and where wires or bars are not feasible, electronic eye devices have been successful. They are available as packaged units which are easily installed.

The standard pushbutton for emergency stops should, in many cases, not be limited to a single control station location, but also should be provided at the front, back or sides of a machine. Many times their nearness to others besides the operator has averted major damage. Conveyor lines often are inadequately equipped with emergency stops; they should be provided at all transfer points and at frequent intervals along the lines themselves. Conveyor sides should be enclosed wherever they cross walkways or roadways when materials being handled are of appreciable size.

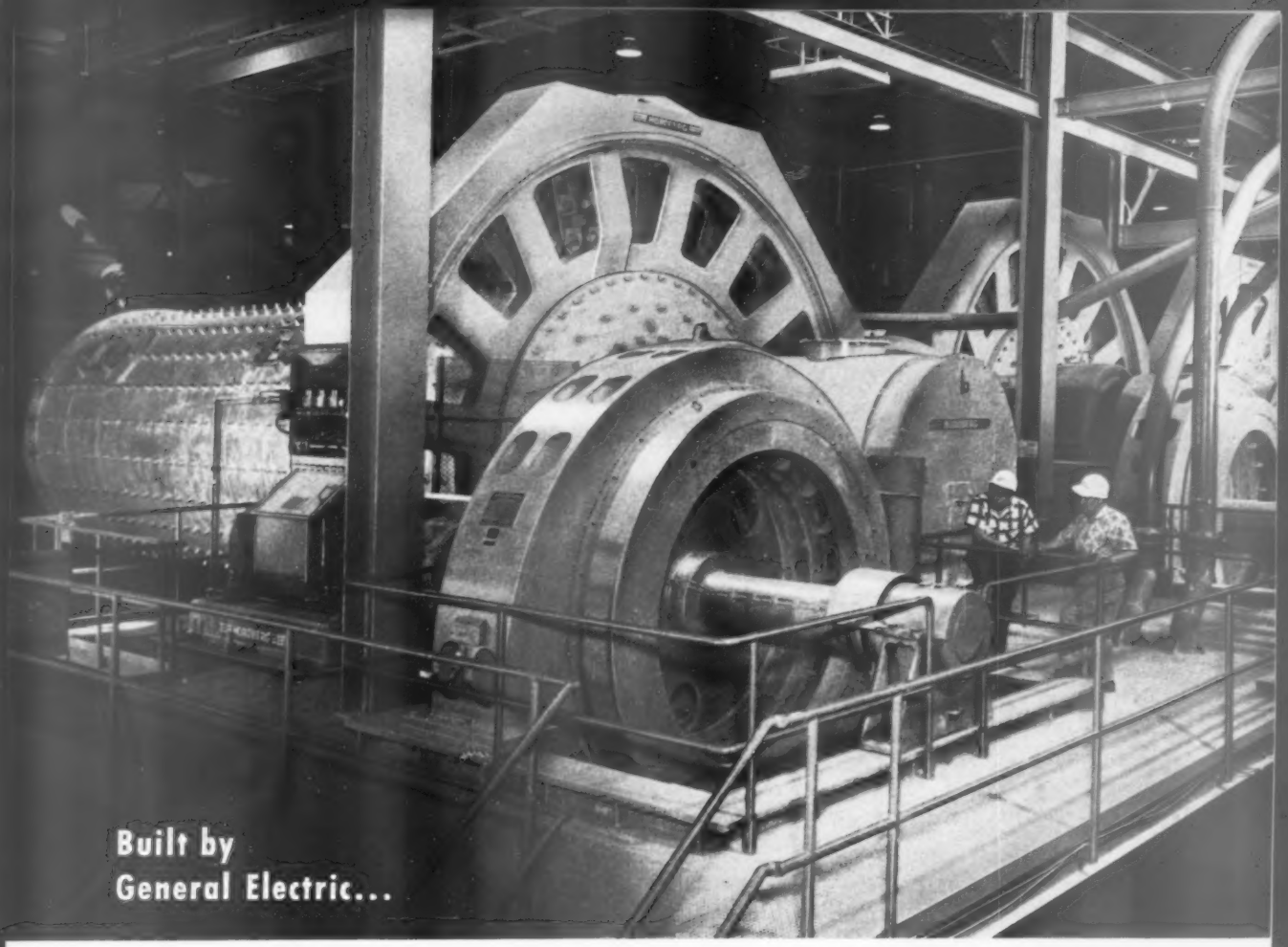
Safety advantages of an automatic line are particularly significant. A central control console or "pulpit" reduces hazardous areas and, in general, keeps personnel out of the immediate area of operating equipment. From this vantage point, each man in the area can be seen easily, and abnormal machine conditions can be detected long before they cause serious trouble. Equipment down for repair is immediately apparent.

This arrangement also permits the use of functional signaling systems with indicating lights to establish sequence or machine operation, along with buzzers and special alarms for abnormal or failure conditions.

Simplicity should be a prime consideration in the design of operating and alarm panels. Flow charts between indicating lights and over-all layouts of the system enable new operators to assume their duties without long, intensive training.

New developments in machine control, such as synchronous motor spotting and inching control, can be a definite safety advantage. With this arrangement a synchronous motor, using low-voltage, low-frequency power, can be inched smoothly

Please turn to page 133



WORLD'S LARGEST Ball-mill Motors Power Huge Cement Grinding Mills

Dundee Cement Company chose General Electric to supply the motors for the largest five ball-mills in the world at its new plant in southeastern Michigan, one of the most modern plants of its kind in the world.

Each of these massive mills contains 400,000 pounds of steel balls plus the tons of material to be pulverized. To drive these immense loads, General Electric designed and built into five 2500 horsepower synchronous motors the "know-how" gathered from years of experience with ball-mill motors.

Each motor provides the torque to start the enormous load from standstill, yet causes minimum voltage disturbance of the power system. It can withstand the adverse conditions of dust and heat and run for long periods without shutdown. These G-E synchronous motors were literally tailor-made to meet all the requirements of ball-mill service.

Engineering and manufacturing experience obtained by General Electric in building hundreds of motors for ball-mill drives, and the proved, dependable performance of G-E synchronous motors on all types of heavy-duty applications, assure you of motors that will withstand unusual demands and require only a minimum of maintenance.

The next time you need drive motors for heavy, continuous-service equipment, be sure to call in your General Electric Apparatus Sales Engineer.

In the meantime, you can obtain more information on G-E synchronous motors by writing for GEA-5959, Section 775-13, General Electric Co., Schenectady 5, N. Y.

LARGE MOTOR & GENERATOR DEPARTMENT

GENERAL ELECTRIC

How to keep a concrete plant at its peak day after day

It takes the strength and smooth efficiency of Hewitt-Robins conveyor belting made of high-tenacity ENKA rayon

The new Jahncke Service, Inc. building materials yard in the heart of New Orleans is primed to deliver 180 cubic yards of concrete per hour to its fleet of transmit-mix trucks—and turn out 300 cubic yards of slaked and aged mortar per day, too.

This kind of accelerated schedule requires a top-notch system of operations as well as the latest and best equipment on the market. That's why this firm chose Hewitt-Robins conveyors and belting to do the job. The incline conveyor, shown here, carries gravel, sand, and aggregate rapidly to shuttle conveyors. It, too, is equipped with the best—strong belting of C/R (cotton and high-tenacity ENKA rayon) fabric.

Once again, Hewitt-Robins uses high-tenacity, long-lasting Enka rayon yarn in their conveyor belting. For they know that low-cost Enka rayon can be counted on for greater strength and smoother efficiency in difficult industrial jobs.

Pound for pound, Enka high-tenacity rayon is your best value in industrial yarns.

Greater strength · More elasticity · Increased heat and humidity resistance · Higher safety factor · More economy · Superior flexibility · Better shock absorbency · Longer service · Less maintenance.

Specify Enka high-tenacity rayon yarns for industrial rubber products, chafer fabrics for truck and passenger tires, heavy-duty sewing thread for multi-wall bag closings and many other vital end-use applications.

Write for Hewitt-Robins brochure on C/R conveyor belting of high-tenacity rayon and cotton. It gives technical data on strength and other characteristics of belting made with cotton-rayon fabric. Write Hewitt-Robins, Stamford, Conn. Ask for bulletin 24A–170.

ENKA high-tenacity rayon for industry

American Enka Corporation, 350 Fifth Avenue, New York 1, N. Y.

Leading producer of yarns and fibers for apparel, home and industry and Tyrex® viscose tire yarn.

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This Red Rubber is a better rubber for runners pumping abrasive pulps because it has...

Higher tensile strength

Higher tear resistance

High resilience and Greater abrasion resistance

This abrasive resistant stock is standard on all runners for DENVER SRL and SRL "Tru-Glandless" Pumps (sizes to 10" x 8"). Other polymers are available for applications involving high temperatures, oils or acids where abrasion is a secondary problem.

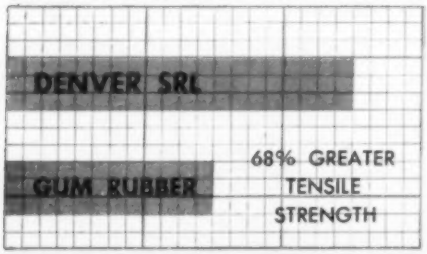
This permits handling coarser pulps at higher pumping speeds and heads...at lower costs!*

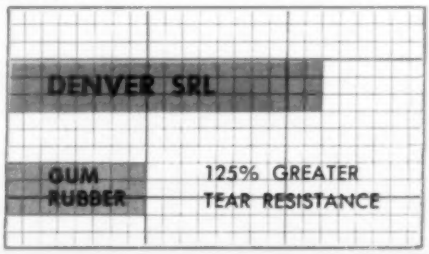
These DENVER SRL Pump runners are especially suited for pumping grinding mill discharge to cyclone classifiers where coarse particles (up to ¾") normally would be a problem.

Tough, live DENVER SRL Red Rubber outwears, outlasts, outperforms generally-used gum rubber and allows DENVER SRL Rubber Lined Pumps to be used where metal pumps have been considered necessary.

**We are interested in cutting your pumping costs—and we have the pumps to do it! Give us a chance at your toughest pumping job.*

THESE CHARTS TELL THE STORY....





= MORE WEARING LIFE
= MORE $$'s SAVED

continued from page 128

ALL SHOOK UP! Many accidents caused by one man starting equipment without knowing presence of another can be prevented by proper "tags" or by "locking out." Locked motor control can be started only after maintenance personnel leave the machine and return the key. Expense is small, safety benefits great

and evenly to a desired position. Inspection is made easier and maintenance work simplified.

Servicing or inspection procedures on large equipment with medium to high voltage should be specified in detail. The manufacturer's service manual is the basic guide, but all too often these manuals do not get into the hands of the man doing the actual work. A positive isolation from the power source, such as opening and locking out disconnects or, preferably, pulling fuses, should be particularly emphasized. If all electrical disconnects are clearly labeled in letters at least 2 in. high, indicating the function and location of equipment affected, the chance of pulling a wrong switch will be greatly minimized.

Special test circuitry and equipment is gaining in use. If some abnormality is noted, it can check out the equipment. When test operating high-voltage starting equipment from a separate ac. power source, steps must be taken to prevent energizing of the secondary winding of the step-down control transformer normally furnished in this type of equipment. Energizing of the low-voltage secondary winding will step up the voltage on the primary side to the line voltage. This is perilous to personnel who may be working in the high-voltage compartments, even though the equipment is completely isolated from the power line.

Extreme caution, alertness, and common sense are prime requirements for personnel working with motor starting equipment and switchgear, regardless of voltage rating and size. Caution should be exercised to prevent operation of current transformers with open secondary circuits. Current transformers attempt to deliver proportional current regardless of secondary loads, and secondary voltage may rise to several hundred or more volts across the open secondary terminals, endangering personnel and equipment.

Electrical testing equipment should be kept up to basic standards without resorting to makeshift methods. Whenever a motor or controller is being placed in service after repair, it should be meggered before the disconnects are closed. Ground faults on low-voltage, ungrounded delta systems can often be detected with ground fault detectors without de-energizing the system.

Voltage indicators or testers should be a basic part of a serviceman's equipment. He should use them without fail before starting any work on electrical equipment. Use of grounding bars or chains, however, is sometimes a matter of dispute. They are not considered necessary on low-voltage grounded circuits when the serviceman performing the job has personal control over the power supply to the unit. He can remove fuses or lock out a disconnect.

Chains do provide protection against a human failure or possible lightning surge on high-voltage feeder lines and other areas where a serviceman has to rely on others to disconnect an installation and keep it disconnected.

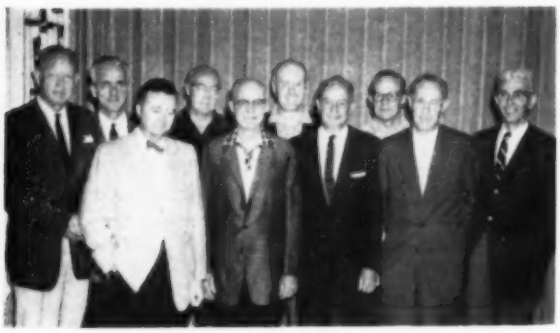
The same applies where disconnect does not ground load side. There is a pattern established; in each case the serviceman performs one act to safeguard himself. He either personally locks out, disconnects or pulls fuses, or grounds the system after the system has been disconnected by a second party. De-energization must be verified by voltage indicator or other approved method before ground is applied.

Placing barrier guards or enclosures around drive equipment has proved its value, but safety demands more. Accidents still occur in drive equipment when doors are opened and not closed, guards removed or otherwise disabled. Oilers have been injured removing guards or entering enclosed areas when service personnel have started a machine, not knowing other persons were in the vicinity.

It is usually a relatively simple matter to interlock with suitably enclosed limit switches all such cover guards and access doors so that when they are opened, the machine's normal controls are rendered inoperative. Interlocks also should be applied wherever there is a sequence of operations in which failure due to misiming of one unit could cause damage or injury.

Editor's note: In the next succeeding part, the authors will discuss how safety for machines protects the large investment in equipment and installation.

NCSA OFFICERS confer at the recent mid-summer Board meeting (left to right): J. R. Callanan, treasurer; Charles Coburn, vice president; G. D. Lott, Jr., president



THE EXECUTIVE COMMITTEE of NCSA (left to right, back row): O. E. Benson, Easton, Pa.; W. C. Rowe, Malden, Mass.; D. L. Williams, Ripplemead, Va.; W. P. Foss, West Nyack, N.Y.; Charles Coburn, Waukesha, Wis. Front row: G. D. Lott, Jr.; Columbia, S.C.; D. C. Harper, Dallas, Tex.; J. L. Holden, Batavia, N.Y.; W. D. Milne, Louisville, Ky.; G. D. Fraunfelder, Easton, Pa. M. E. McLean, East St. Louis, Ill., was absent when the photograph was taken

EXECUTIVE COMMITTEE of NCSA's Manufacturers Division smiles for the photographer (left to right, back row): Wayne W. King, W. S. Tyler Co.; J. Craig McLanahan, McLanahan & Stone Corp.; B. R. "Ben" Maloney, E. I. duPont de Nemours & Co.; Irwin F. Deister, Deister Machine Co. Front row: L. A. "Larry" Eiben, Northern Blower Div., Buell Engineering Co., Inc.; L. A. "Dusty" Rhodes, Stedman Foundry & Machine Co., Inc.; C. Darrell Smith, Joy Manufacturing Co., vice chairman; George D. Fraunfelder, Easton Car & Construction Co., chairman; W. E. "Bill" Collins, Jr., Atlas Powder Co.; J. R. Boyd, National Crushed Stone Association executive director

Congress' new law covering percentage depletion changes only slightly the position of industry producers

Depletion question stabilized for stone producers

PERCENTAGE DEPLETION for the crushed stone industry now, at long last, appears to be set for a few years to come. Provisions of the new Tax Extension Act are responsible. Industry producers lose relative little in allowances for depletion, since the only process excluded is fine pulverization. Some are of the opinion that not all of that will be lost.

Though the new law, effective for all business after December 31, 1960, doesn't put anything in the plus column for the crushed stone industry, the situation could have been disastrous.

A complete review of the percentage depletion situation was presented to the Midyear Meeting of the Board of Directors, National Crushed Stone Association, by its general counsel, Mr. J. F. Lane of Gall, Lane & Howe, Washington, D.C. Mr. Lane also reviewed the status and possible effects of legislation, court decisions and administrative regulations in other fields affecting the industry. His presentation was a highlight of the regular business meeting of the Board, which was held at White Sulphur Springs, W. Va., Aug. 11-12, 1960.

Action of the Association and its members is credited with helping to avert the passage of a depletion law that could have been much more unfavorable to the industry. In June the senate had passed a proposed bill onto which was tacked an amendment that possibly would have cut back depletion allowances for quarry operators to the quarry face. Since the Senate and House bills differed, the matter went to Conference in a committee representing both houses. At this point, the Association and its members got busy and pre-

Please turn to page 136

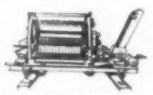
40,000 ABRASIVE TONS

Grinding over 40,000 tons a year of lightweight aggregate produced by a patented process from bituminous coal refuse is the job of this AMERICAN #9 GRINDER, owned by Trulite Corporation, Ceredo, West Virginia.

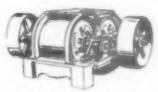
C. M. Howard, general manager, comments, "We choose the AMERICAN #9 GRINDER because of its reputation for durability and low maintenance. Our aggregate is extremely abrasive but the AMERICAN requires much less maintenance than other grinders we have used."

If the reduction of lightweight aggregate, cinders, pumice, haydite, slag, other mine and quarry products presents a problem in your plant investigate these AMERICAN features: Grinds wet or dry, no screen plates required, suspended mullers are adjustable to volume and size requirements, long wearing gears are cast material, only 25 horsepower required.

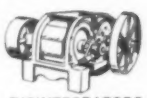
Do your job the AMERICAN way.



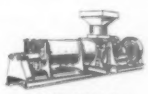
ELECTRIC CUTTERS



SMOOTH ROLL CRUSHERS

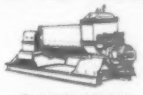


DISINTEGRATORS



PUG MILLS

GRINDERS



COMBINATION DE-AIRING MACHINES

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CLAY MACHINERY

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DEPLETION QUESTION STABILIZED FOR STONE PRODUCERS

continued from page 134

sented the industry viewpoint to Conferees. The final result was agreement on a substitute amendment that, although not purely a victory for industry, was much more acceptable.

Numerous questions remain to be answered on the fine pulverization picture. It is expected that these will be resolved by Treasury regulations at some future date. Although there are no clues as to what determinations will be on pulverization, one interpretation is that the manufacture of fines is depletable if those fines result from a depletable grinding process.

Goldbeck honored for faithful service

Mr. A. T. Goldbeck (left), former engineering director then engineering consultant for National Crushed Stone Association, said goodbye to the NCSA Board of Directors at its mid-summer meeting at the Greenbrier, White Sulphur Springs, W. Va., Aug. 11, 1960. He served the Association for 35 years during which he contributed much in engineering knowledge to the industry, to the Association and its members. His important work in behalf of NCSA was recognized by presentation to him of an engraved silver tray. Mr. George D. Lott, Jr., president of NCSA, made the presentation at the recent Board meeting

The decision in the Cannelton Case by the Supreme Court (see ROCK PRODUCTS, August 1960) did not lay down a broad cut-off rule for percentage depletion, nor did it in any way directly affect the crushed stone industry. It did, however, knock out the profitability test and eliminated all commercial considerations. This decision is applicable to business this year and all previous years to which the 1939 and 1954 codes apply.

The field of depreciation is being studied now by the Treasury Department. It distributed a questionnaire on the subject to about 2,700 businesses in July, and the Small Business Administration has sent out 3,300 more. According to reports, Treasury feels that it will be equipped with factual information on which to base possible revision of depreciation law, when it gets back the completed survey. If a questionnaire is received by any crushed stone producer, it is suggested that it be completed and returned.

Replacement depreciation and reinvestment depreciation are two proposals that are being studied. The former would mean that the law be changed to allow an amount for additional replacement charge over the actual cost. A difficulty registered against this proposal is the enormous revaluation process that would be involved.

Reinvestment depreciation differs from replacement depreciation in that the latter would require a revaluation on all equipment now, and depreciation would be taken on that basis. Under this plan, equipment would have to be revalued each year. Reinvestment depreciation requires a revaluation at the time of replacement of equipment.

The NCSA Board has this subject under constant study, and plans to continue while the Treasury Department is considering the proposals.

Salvage value is another topic that has held the spotlight in depreciation calculations the past few years. One opinion is that there is no chance to get a change in the status of salvage value without legislation. Treasury has had a clear-cut victory in courts on it. Nothing additional has been done with Bulletin F of the Treasury Department, which contains suggested information on life of equipment.

The "common situs" picketing bill is considered a bad bill for industry. It didn't get out of the Senate Committee on Labor in the short summer session, but expectations are that it will be

Please turn to page 138

PRODUCTION – *NEW STRENGTH FOR SOUTH KOREA*

Private enterprise is turning South Korea into an industrialized, highly productive country, to the benefit of all her people.

This is exemplified by the Mungyong plant of Korea Cement Manufacturing Company, Ltd., which operates two F.L. Smidth rotary kilns, each 3.15 • 2.85 • 3.15 metres dia. x 123 metres long.

"MAGNECON" kiln liners, uniquely the product of Canadian Kilmar magnesite, are used in the hot zones of these kilns. The "MAGNECON" liners contribute substantially to economy of operation by giving roughly five times the service life of previously-used refractories. A recent report from Korea Cement, covering 335 days of service, concludes "The quality of 'MAGNECON' is superior and satisfactory."

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CANADA CEMENT BUILDING, MONTREAL, CANADA

Write for technical folder "'MAGNECON', the hot zone refractory to keep your kiln on the line".

2318

DEPLETION QUESTION STABILIZED FOR STONE PRODUCERS

continued from page 136

POST-SESSION CONFAB between D. L. Williams of Virginia, T. C. Cooke of Massachusetts and O. E. Benson of Pennsylvania

brought up at the new session of Congress. The bill would establish specific exemption of the construction industry to the Landrum-Griffin labor law. It is felt that a danger of this on-site picketing bill is that it would go beyond contractors to suppliers of material.

Here's how it might work. Assume that an operator is not organized, but organizational efforts are being directed toward him. He gets an order for material to be supplied to a large construction job. Under the new proposed law, labor could picket the construction job and bring pressure back to the operator to organize, because ostensibly the operator would be holding up a construction job.

New help on federal wage and hour law is a project NCSA is now working on. It is to come in the form of a handbook that will discuss these laws as they apply to stone producers. Specifically, the manual will contain information on the Bacon-Davis Act, the Fair Labor Standards Act and the Walsh-Healy Act. Nothing on this is in print now, but the matter will be discussed at the association's annual meeting during January 1961.

The highway program for the next couple of years should be an enlarged and enhanced program. NCSA executive director J. R. Boyd covered developments in this field in his report to the Board, as well as those in association accident prevention, membership, finances and others.

Money for the highway program, or rather the lack of it, was a major reason for a slow start this year. The road ahead, though, looks better. Commerce Secretary Mueller has announced that $2.9 billion in federal funds would be available to states for the fiscal year 1961 which began July 1 this year. Also, the Secretary announced a $2.2-billion apportionment for the interstate program for fiscal 1962, if Congress didn't pass amendments restricting income to the Highway Trust Fund. It didn't, but did provide ABC funds to the tune of $925 million a year for fiscal years 1962 and 1963.

Congress probably will take a good hard look at the highway program this next session. The Bureau of Public Roads is scheduled to report to Congress early in the session on studies it is making on highway costs and benefits. This may be the basis for new legislation to increase funds in support of the program on a more equitable basis. Also, the American Association of State Highway Officials is expected to report on its road test early next year.

You may hear more on control of federal highway construction by Congress next year. The so-called Blatnik Committee of the House uncovered some irregularities in construction on federal projects this summer, and it is expected that the Committee will continue its search. As a possible result, Congress may accent stricter supervision in contract performance. To get away from more federal controls, some state organizations are setting up new guide lines for all phases of highway construction and engineering.

There is a feeling, too, that the Bureau of Public Roads doesn't have the control over the huge expenditures for federal highways that it should have for maximum effectiveness. Some think that the Bureau should be set up in a department by itself.

Accident prevention is getting more and more attention by the industry and the association. A speedup in the work required to prepare certificates for individual employes of plants making perfect records in the NCSA Safety Contest has been effected through cooperation with the U. S. Bureau of Mines. Certificates will be distributed much sooner than before, under the new setup.

The NCSA Accident Prevention Committee has begun a new safety service. It will be in the form of periodic releases, called "Safety Service," designed "to provide a medium for the exchange of safety information, ideas and news of specific interest to management." The releases will be edited and processed within the NCSA office.

Both the association Accident Reporting Program and the Safety Contest are becoming more popular. Participating plants in the former jumped from 108 in 1959 to 173 in 1960. Comparable figures for participants in the Safety Contest are 104 in 1959 and 134 in 1960. Also, number of accident-free plants rose from 33 in 1958 to 61 in 1959. These data reflect the good work that the committee has done.

Engineering service to NCSA members continues to grow. The laboratory staff of the engineering department divides its time in proper proportion between service testing for members and research. Significant accomplishments have been made in both fields of activity, according to Engineering Director J. E. Gray.

Service testing of many valuable types has been conducted this past year. Included are those on alkali aggregate problems, determination of the presence of unsound materials, particle shape, skid resistance, base materials and many others. Some of these tests require much time, but the object of the engineering service is to do a thorough job in collecting pertinent data, to give members the best possible basis for making the proper decision.

Some important factors have been noted as a result of thorough service testing. In some cases where stone was suspected as the cause for concrete failure, lack of strength of the concrete was found to be due more probably to the lack of control of mixing water and curing conditions. As many as eight states or agencies have changed specifications regarding flat or elongated stone, rendering requirements less restrictive. NCSA tests show that stone down to ⅜-in. size should not have more than 10 percent of material classified as flat and elongated particles.

Research work on several types of projects of interest to the industry and NCSA members is continuing. Some are: (1) study of aggregates with respect to potential creation of plastic fines, (2) Los Angeles abrasion variability, and (3) study of characteristics of dense graded crushed stone base material.

Several proposed methods of tests have been investigated in studying the problem of failure of base courses through the creation of plastic fines. It is believed that these tests are applicable in detecting aggregates that have a high shale or clay content, or are so altered as to readily produce minerals with a significant clay content.

Another research project gave evidence that materials should not be rejected or accepted on the basis of one L. A. test result if the rating is within 3 percentage points either way of specifications. Such material should be given another test.

The final report of NCSA Engineering Consultant A. T. Goldbeck was presented after 35 years of devoted service to the association. His long years of faithful service were recognized by presentation from the Board of an engraved silver tray.

Arrangements for the next annual convention have been set. It will be held at the Americana Hotel, Bal Harbour, Fla., Jan. 17-20, 1961. The pattern for that meeting will follow closely the one that was so successful for the 1959 Florida convention. General sessions will be held Tuesday (17th) and Friday (20th) mornings only. Special sessions will be held Tuesday afternoon, Wednesday morning and Thursday morning. Some of them will be held concurrently on those days. Special luncheons will include a greeting luncheon on Tuesday, a general luncheon on Wednesday and the Manufacturers Division luncheon on Thursday. A big dinner with planned entertainment will be held Thursday evening. The convention will adjourn after the Friday morning general session.

A regular Board meeting will be held in the Americana Hotel on Jan. 16, 1961, the day before the convention begins. The next mid-summer meeting of the Board is scheduled for the Greenbrier, White Sulphur Springs, W. Va. Dates for the meeting have not been determined yet.

The Manufacturers' Division executive committee held a meeting in conjunction with the Board meeting at the Greenbrier. Since the annual convention next January will be held the week prior to the annual meeting of the National Sand & Gravel Association, at the same hotel, a limit on rooms for manufacturers' representatives staying over for NSGA meeting is expected. The executive committee was urged to cooperate with NSGA as much as possible, to help reduce the extent of a possible room assignment problem.

The next issue of the Division's classified directory will be available just prior to the annual convention next January. The executive committee has revised the listing, to bring it up to date and to make it a more useful tool. The directory contains one section of product classification, and another that lists division membership by name and also by products manufactured. Miss Beatrice Gay, Washington staff, is editor of the directory. END

Cost analyses demonstrate the economy of tandem pushing for big scrapers

You can cut stripping costs

by R. N. Hancock*

OF ALL THE QUARRY EQUIPMENT that is stubbornly tough to budge, the scraper is probably the toughest. This behemoth of the stripping operation takes a determined pusher to keep it moving —and sometimes even that extra power isn't enough. There are times when it is more economical to use two pushers working in tandem. Elaborate test data will bear me out.

Rather than generalize about tandem pushing as a cost-cutting method, I propose to give you "just the facts, sir." Added together, the facts show that tandem pushing offers shorter load time, bigger loads, greater production and, usually, lower cost per cu. yd. This is especially true when scrapers are encountering poor loadability of material, poor traction and, above all, when they are too large for efficient loading by a single pusher.

From a look at the data in accompanying charts, you will see that several conclusions can be drawn: As total ground resistance and haul distance increase, so do the savings in cost per cu. yd. with tandem pushing. Furthermore, advantages of tandem pushing are more pronounced with heavier material. Finally, total scraper production is higher with tandem pushing than with scrapers split into two spreads and pushed by single tractors.

Machines used in the studies were 320-hp. crawler tractors equipped with torque converters, and tractor-scrapers of 24-cu. yd. struck capacity. Materials removed were sand, weighing 3,100 lb. per bank cu. yd. (bcy.), and clay, weighing 3,400 lb. per bcy. In the former, tandem pushing provided an average of 55 bcy. (23 percent) greater produc-

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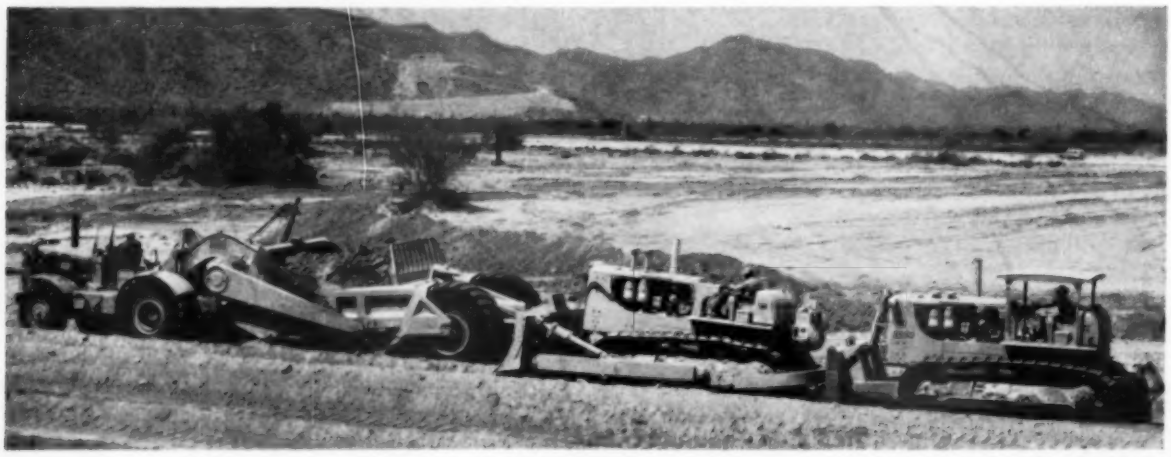
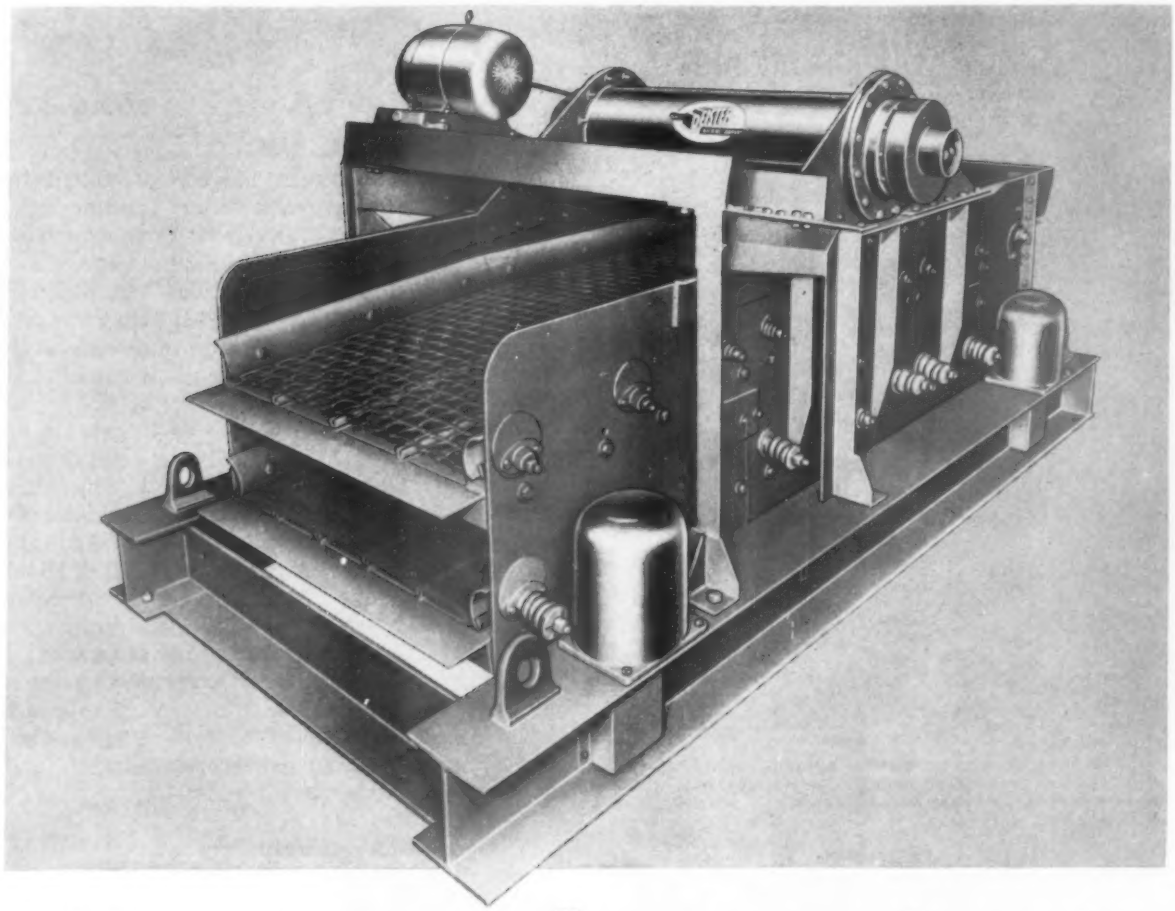
*Market Div., Caterpillar Tractor Co.

STRIPPING ECONOMY requires tandem pushing. Here, a pair of 320-hp. tractors load a 24-cu. yd. scraper at top speed. The lead pusher is properly equipped with a track frame-mounted dozer and rear C-frame push block. The second pusher is correctly using an inside-mounted cushion dozer and rear-mounted cushion push block





Deister announces an all-new suspension system featuring ENCLOSED Spring & Rubber MOUNTS

"To provide the lowest cost per ton of material screened with the least amount of attention and downtime" —this has been the Deister objective throughout 35 years of vibrating screen manufacture.

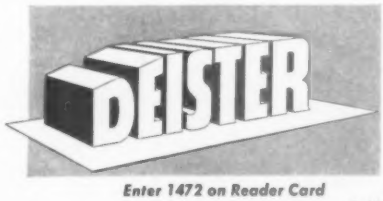
In line with this objective, Deister Machine Company has now developed an all-new suspension system for the "live" or vibrating frame of its line of vibrating screens. It consists of a heavy H-beam stationary base on which are mounted ENCLOSED Spring and Rubber MOUNTS to carry the "live" frame.

The new mounts are located *outside* the side plates at the four frame corners. Each mount consists of a heavy coil spring working in conjunction with a solid rubber isolator *to eliminate completely* the transmission of vibration to the supporting structure.

Each mount is protected by an easily removed cover. Spring adjustment or replacement, if ever necessary, becomes a simple "wrench" job that can be done in a matter of minutes.

No extra cost is involved if cable suspension is desired. Cables can be attached directly to the four lugs on the base. The effectiveness of the new mounts eliminates the need for cable suspension springs.

In order to simplify installation, Deister Vibrating Screens are supplied as a complete package instead of separate parts. The vibrating frame, stationary base, motor support and V-belt drive are assembled into a properly coordinated unit at the factory.



DEISTER MACHINE COMPANY
1933 East Wayne St., Fort Wayne, Indiana

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YOU CAN CUT STRIPPING COSTS

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CLOSE-UP OF INSIDE-MOUNTED CUSHION DOZER shows twin housings, each with two columns of rubber discs. Located near top of blade, rubber springs compress under impact, absorb 100,000 lb. of force before bottoming

TRACTORS SHOULD BE PROPERLY EQUIPPED with tandem pushing attachments to avoid undue wear on final drive assemblies. (1) Improperly equipped front pusher has push block on rear case and C-frame (or dozer) mounted on track roller frames, causing force to pass through final drive. (2) With inside dozer and rear push block mounted on main frame, stress passes directly through frame. (3) Front and rear-mounted C-frames enable force to bypass final drive via track roller frames

tion per unit at 10 percent less cost per cu. yd. In the latter, results were even better: Tandem pushing averaged 78 bcy. (35 percent) greater production per unit at 17 percent less cost per cu. yd.

Eighteen different job situations were studied. Equipment performance was tested with three different haul distances and three total resistance (TR) factors. The latter include ground and grade conditions.

A rolling resistance factor of 65 lb. per ton of gross machine weight was used as a point of reference. This applies to a firm, smooth, rolled-dirt roadway, flexing slightly under load, maintained and watered fairly regularly. Grade is taken into account by adding or subtracting a factor of 20 lb. per ton for each one percent of grade resistance or assistance. On the average job, total resistance factor is usually between 80 and 120 lb. per ton.

Tandem pushers produced larger scraper loads in both sand and clay, particularly in this last heavier material. Because the tandems cut pusher cycle time, they could handle more scrapers and get the job done faster.

What does this mean in dollars and cents? To determine how much tandems actually cut stripping costs, we must first establish the hourly owning and operating costs of the equipment. These costs, based on averages compiled from numerous job studies, include operator's wages: tractor-scraper,

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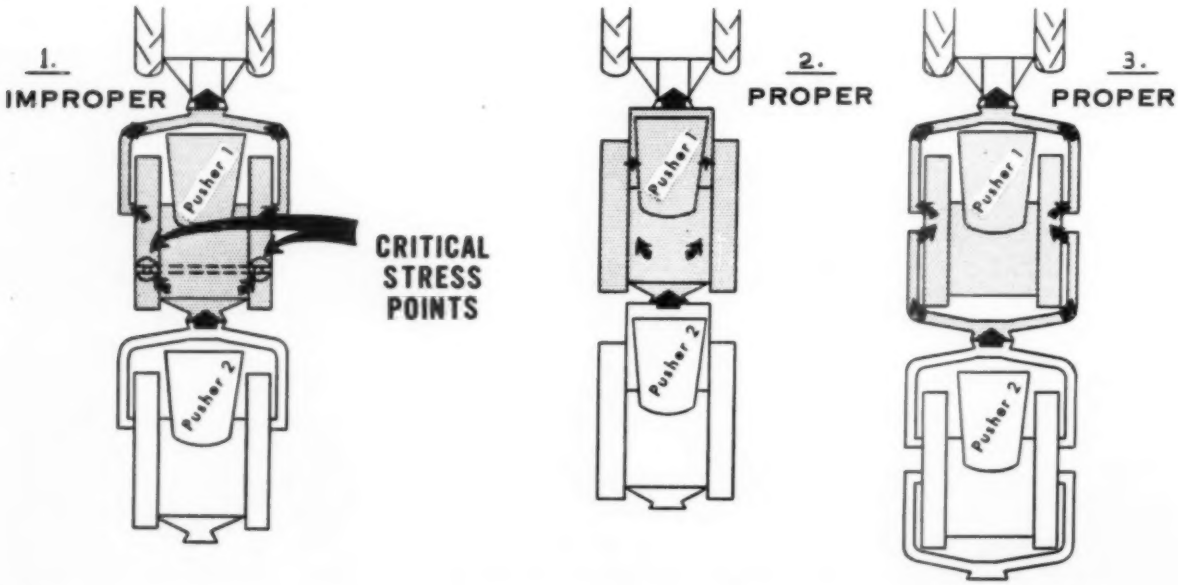

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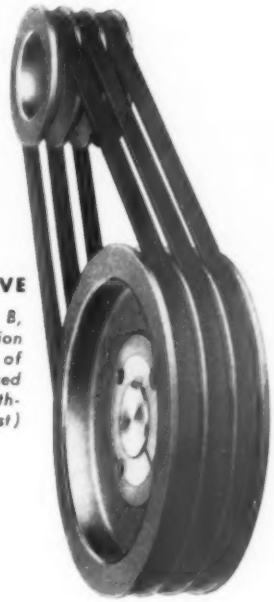
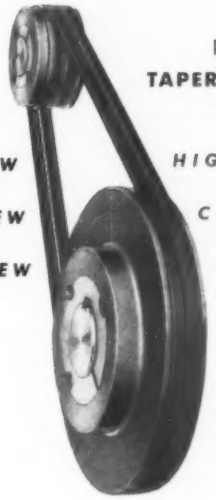
V-Belt Drives.....

DODGE Dyna V



BIG-GROOVE TAPER-LOCK DRIVE

(— using standard A, B, C, D and E cross section belts, the hp ratings of which have been increased an average of 40% without any increase in cost)



DYNA-V TAPER-LOCK DRIVE

NEW HIGH CAPACITY

NEW COMPACTNESS

NEW SAVINGS IN COST

COMPARISON, ILLUSTRATED ABOVE — 3 HP, 1750 RPM, 2.41 TO 1 RATIO

	BELTS		SHEAVES			CENTER DISTANCE	HP	WEIGHT (LBS.)	COST	
	Number	Size	O.D. Driver	O.D. Driven	Width				Per hp	Per Drive
BIG-GROOVE TAPER-LOCK DRIVE	3	A42	4.15"	8.95"	2½"	12.3"	4.62	24.7	$5.62	$25.98
DYNA-V TAPER-LOCK DRIVE	2	3V400	3.35"	8.00"	1 3/32"	10.8"	5.0	18.0	$4.50	$22.50
% SAVING *Savings vary with different sized drives*			**19%**	**10%**	**56%**	**12%**	+	**27%**	**19.9%**	**13.4%**

Dyna-V Drives are sensationally compact. They are capable of handling up to three times as much horsepower in a given space. Dyna-V opens vast new possibilities for better, more economical machine design. And, in most instances, *Dyna-V costs less!*

Narrower grooves, to match stronger, narrower Dyna-V Belts, greatly reduce the face width and the weight of Dyna-V Sheaves. Cost is lowered. Smaller diameter sheaves and shorter center distances multiply savings.

Dyna-V Sheaves decrease shaft overhang—increase bearing life. The new dimensional stability of Dyna-V Belts solves the problem of belt matching. Every belt carries its full share of the load.

Dyna-V Drives are available for capacities from 1 to 1500 hp. Ask your Dodge Distributor. Or write us for new Dyna-V Bulletin.

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CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery".

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YOU CAN CUT STRIPPING COSTS

continued from page 142

$18.05; single tractor, $17.52 and tandem tractors, $18.21 each (this includes a rear C-frame and push block).

Let's consider the study in which equipment worked in clay with a 3,000-ft. haul and 120 lb.-per-ton total resistance:

	SINGLE	TANDEM
Number of scrapers	5	7
Hourly unit production (bcy.)	181	246
Hourly cost of scraper plus pusher(s) cost, apportioned by number of scrapers pushed	$21.55	$23.25
Cost per cu. yd.	$0.119	$0.094

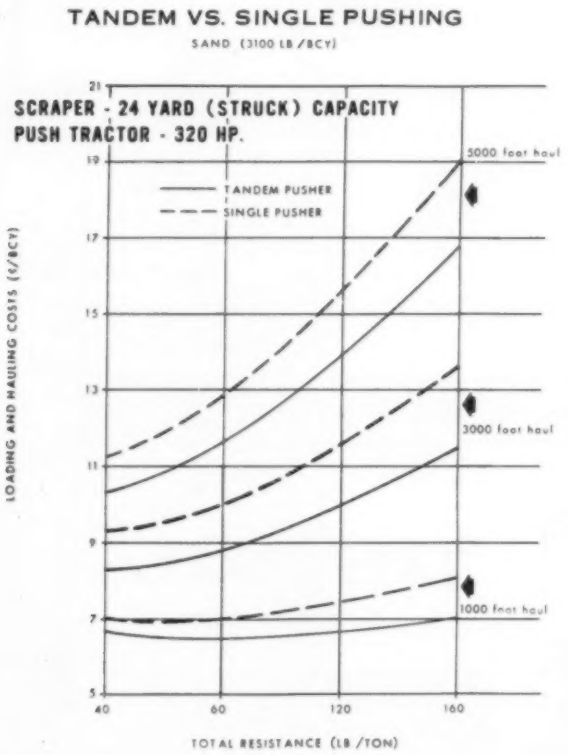
At this rate, for each million cu. yd. stripped, cost savings would be $25,000.

From the standpoint of production time alone, the producer—or stripper, in this instance—could move the clay in almost half the time by adding only two scrapers and another pusher. Thus, to move 200,000 cu. yd. of overburden, the single pusher spread would take 22 days, but the tandem spread only 11.6 days to complete.

TABLE I—Comparison of single and tandem pushing in sand stripping operation: 3,100 lb./bcy.

Total resistance (lb./ton)	80		120		160	
Pusher arrangement	Single	Tandem	Single	Tandem	Single	Tandem
Haul distance—1,000 ft.						
No. of scrapers	2	3	2	3	2	3
Single unit prod. (bcy./hr.)	380	464	342	460	330	415
Unit prod. advantage (%)	—	22.0	—	35.0	—	26.0
Total prod. (bcy./hr.)	760	1,392	752	1,380	660	1,245
Haul distance—3,000 ft.						
No. of scrapers	3	5	4	6	5	7
Single unit prod. (bcy./hr.)	246	292	191	251	153	188
Unit prod. advantage (%)	—	19.0	—	31.0	—	23.0
Total prod. (bcy./hr.)	738	1,460	764	1,506	765	1,316
Haul distance—5,000 ft.						
No. of scrapers	4	7	6	8	7	10
Single unit prod. (bcy./hr.)	181	213	129	145	105	127
Unit prod. advantage (%)	—	18.0	—	12.0	—	21.0
Total prod. (bcy./hr.)	724	1,491	774	1,160	735	1,270

ADVANTAGES OF TANDEM PUSHING become more apparent as total ground resistance rises. At a resistance of 160 lb. per ton, cost-per-cu. yd. savings range from 1 to more than 2¢ per cu. yd.



Tandem pushing reduces cost per cu. yd. as shown on the graphs. In the 3,100-lb. per bcy. sand, for example, cost-per-cu. yd. savings ranged from 1 to more than 2¢ at 160 lb. per ton total resistance. Working in the heavier clay, savings extended from 1½ to 5¢ a cu. yd. at 160 TR. In both studies, the spread in savings became more apparent as total resistance increased.

In a discussion of tandem versus single push-loading, the question often arises: Why not split the spread and use two single pushers? Generally speaking, this is less advantageous than combining the scrapers and pushing them in tandem, because the added power of tandem tractors gives bigger individual loads in less time than are possible with single pushers.

In the sand study, for example, at 5,000 ft. and 80 lb. per ton TR, a single tractor is pushing four scrapers. Total hourly production is 724 bcy. If the spread were doubled so that 8 scrapers and 2 single pushers were used, production would amount to 1,448 bcy. But this is still less than the 1,491 bcy. possible with 7 scrapers tandem pushed.

Tandem pushing requires some precautions. Higher stresses are created on the scrapers and lead tractor when pushing in tandem with greater power and bigger loads. As a result, maintenance costs may rise slightly. The bowl bottom is a wear

point on small-size scrapers. It may require additional reinforcement to withstand the great thrust from tandem pushers. This is particularly true in rocky material. Tire wear caused by heavier loads is offset somewhat by less tire slippage in the cut because of the additional push power.

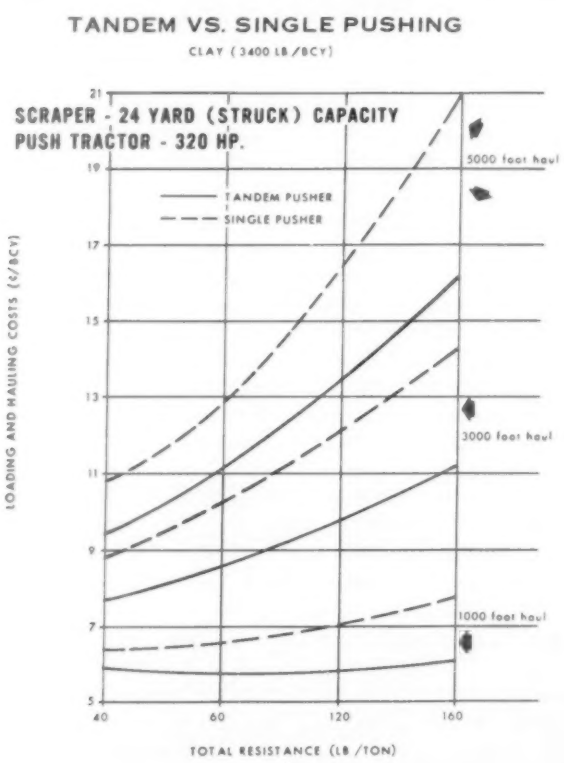
Undue stress on tractor final drive assemblies can be avoided by using the proper tandem pushing attachments. Installing rear-mounted C-frames with track frame-mounted bulldozers is one way of bypassing pushing forces on final drive casings. The C-frame transmits the force of the second tractor to the push arms of the lead tractor when it is bolted directly to the track roller frame.

A push plate or inside-mounted dozer on the main frame in front and push block in the rear on the transmission case is another acceptable method. But a case-mounted push block should not be used in conjunction with a track frame-mounted bulldozer on the same tractor.

TABLE II—Comparison of single and tandem pushing in clay stripping operation: 3,400 lb./bcy.

Total resistance (lb./ton)	80		120		160	
Pusher arrangement	Single	Tandem	Single	Tandem	Single	Tandem
Haul distance—1,000 ft.						
No. of scrapers	2	3	3	3	3	4
Single unit prod. (bcy./hr.)	412	535	330	515	312	432
Unit prod. advantage (%)	—	30.0	—	56.0	—	38.0
Total prod. (bcy./hr.)	824	1,605	990	1,545	936	1,728
Haul distance—3,000 ft.						
No. of scrapers	4	6	5	7	6	9
Single unit prod. (bcy./hr.)	230	285	181	246	145	191
Unit prod. advantage (%)	—	24.0	—	36.0	—	32.0
Total prod. (bcy./hr.)	920	1,710	905	1,722	870	1,719
Haul distance—5,000 ft.						
No. of scrapers	5	9	8	10	10	13
Single unit prod. (bcy./hr.)	170	193	116	166	91	128
Unit prod. advantage (%)	—	14.0	—	43.0	—	41.0
Total prod. (bcy./hr.)	850	1,737	928	1,660	910	1,664

WORKING in 3,400-lb. per bcy. clay, savings extend from about 1.5 to 5¢ per cu. yd. Tandem pushing gave an average of 35 percent greater production at 17 percent less cost per cu. yd. Loadability of material, traction in the overburden and scraper capacity are three factors that affect tandem pushing effectiveness



Shock impact can be avoided with an inside-mounted cushion dozer and case-mounted cushion push block. Contact can be made at relative speeds up to 3 mph. without imposing severe strain on any of the units or the operators.

With the cushion dozer, four columns of rubber discs create a spring-like action. Located near the top of the blade, they compress under impact, absorbing up to 93,000 lb. of force before bottoming. The high-speed, cushioned approach reduces operator and machine fatigue, lowers pusher cycle time and, thus, increases production.

A case-mounted cushion push block in the rear permits high-speed tandem pushing by allowing the second tractor to make contact at 3 mph., pick up the load and surge through the cut. Pushing force is transferred through the main frame.

Equipping both tractors with proper pushing attachments, both front and rear, permits alternating them as lead pushers. This is a real time-saver. At the end of the loading cycle, instead of both pushers boosting the scraper out of the cut, the rear tractor peels off and begins pushloading easy yards of material into another scraper. A few moments later it is joined by the second tractor as the going gets harder.

The economies of scraper operations are centered in the loading phase of stripping. It is here that load time and size of loads are determined. These are the prime factors affecting production and cost per cu. yd. And they are the prime reasons for tandem pushing under conditions I described.

Information on all matters affecting financial aspects of a business flowed freely among NSGA and NRMCA company comptrollers at August meeting

Controllers swap ideas in workshop conference

CONTROLLERS OF SAND AND GRAVEL COMPANIES and ready-mixed concrete companies can jam more information on financial affairs into a 1-day meeting than an average person can absorb in a week. They did it on Aug. 15, 1960, when they met for an annual conference at French Lick, Ind. Nearly 100 of them stayed over an extra day to meet with the National Sand & Gravel Association and National Ready Mixed Concrete Association Joint Committee on Fiscal Policies.

Major benefits of the Controllers Conference, it was reported, are the person-to-person contact and freedom in exchange of ideas among those who handle their company's financial affairs. This is the second such conference in as many years, and was received so well that controllers want it to be a regular annual affair.

They discussed, asked questions about and swapped ideas on percentage depletion, depreciation, expense accounts, leasing equipment, discounts, cost ratios, insurance and other pertinent subjects. Qualified experts dispensed up-to-the-minute information on federal tax laws and latest official interpretations of those laws including pertinent court cases. Other experts gave the group the benefit of their experience on the practical effect in the industry of the percentage depletion provisions of the new tax act, and on application of existing Treasury regulations covering expense accounts. One company's complete insurance program was described. Mr. J. L. Shiely, Jr., of St. Paul, Minn., acted as chairman of the meeting in the absence of Mr. Henry H. Kirwin, chairman, Joint Committee on Fiscal Policies, NSGA and NRMCA.

"What to do in starting a new venture," discussed by Mr. Stuart M. Berman of Booz, Allen & Hamilton, was a subject of interest to all. He summarized the subject by stating that every business should have future operating plans.

Specifically, possible sources of new capital for a new plant project or expansion of an old one will want to know: (1) where the business has been, how it got to its present position; (2) where it is to go in the future, and (3) plans for source of funds that will satisfy lending agencies as well as the company itself. Much investigation is required to get the proper answers.

Washington action on percentage depletion, according to Mr. Richard Brady of Covinton & Burling, would seem to be aimed more specifically at the cement and brick and tile industries. It may be too early to know, but it is expected that neither the new Tax Rate Extension Act nor the decision in the Cannelton Sewer Pipe Case will have an adverse affect on the sand and gravel industry.

With respect to depreciation, there appears to be a wide difference between the taxpayer and the Treasury Department on useful life of equipment. The Supreme Court in three cases has interpreted useful life to be that life of equipment actually employed by the taxpayer less the salvage value at the time of disposal. The government has stated, in effect, that it is not the economic life of equipment that should be considered, but the life of equipment actually experienced in your own business. Salvage value will be a term you'll hear more about in the future from the revenue agent.

On expense account items, the Commissioner of Internal Revenue has made a couple of significant announcements. One concerns what the employer must report, indicating the feeling of the Department. The other concerns the new legislation, which is aimed at curtailing entertainment expense as a deductable item. The Internal Revenue Service apparently is after those items that have been charged to the company by officers that

Please turn to page 152

Day in, day out, depend on **WEMCO**

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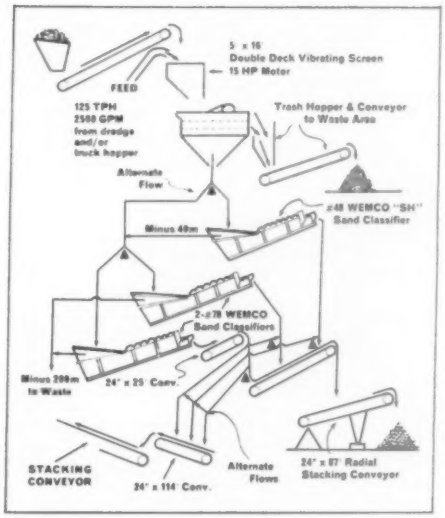
John G. Wisneski, Plant Superintendent (above), and Frank Lapa, Sand Division Manager, Sayre & Fisher Sand Co., Sayreville, N. J., say:

"We highly recommend Wemco Sand Prep Machines to anyone"

"Wemco Sand Prep Machines are indispensable in our production of specification aggregate for concrete, mason, plaster, asphalt, brick sand and for various industrial uses. Wemco flexibility permits quick adjustment to varying requirements of material. Changes can be made by means of the adjustable end weirs and by reblending products. Operation is trouble-free, and we've eliminated downtime and parts replacement. Wemco's lifting device has saved us in many a tight spot, including push-button start-up under overloading or in sub-freezing weather. We recommend Wemco to anyone . . ."

With Sayre and Fisher, as with other top aggregate producers, dependability is a must for profitable operation. Only Wemco meets all requirements with these features: slow spiral speed . . . multiple pitch spirals . . . large and quiescent pool . . . and the exclusive Lifting Device.*

Get the complete story on Wemco's consistent superiority on the job—from your nearest Wemco representative.



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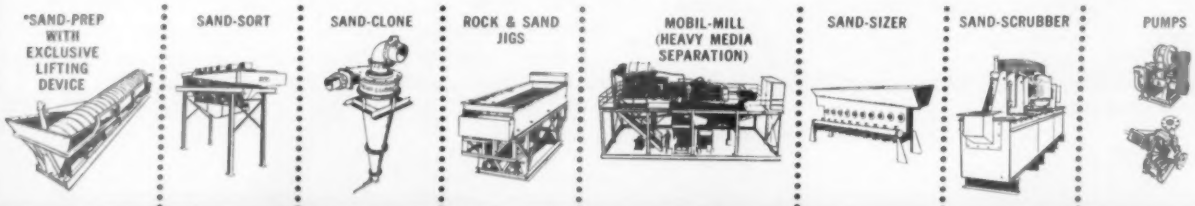
THE WEMCO LINE OF QUALITY MACHINES FOR PROFITABLE AGGREGATE PROCESSING



CONSTANT-SPEED KILNS PAY OFF

continued from page 108

been rated by us taking Kiln A (4,810 cu. ft.) as a guide; adopted 5,000 cu. ft. as the volume of a 100-percent unit kiln (see Table 2).

6. Checked all around the feeding of the kiln and decided it was the trouble point to watch.

7. Concentrated on improving the control and removal of impediments to steady feed by minute adjustment.

8. Stopped arching and sticking up by changing shape of feed bins to promote steady flow.

9. Insulated all bins to prevent sweating and sticking.

10. Removed choke flights from feed screws.

11. Set feed screws horizontally.

12. Made all feed screws of equal diameter, regardless of size of kiln or requirements, so that revolution counters recorded roughly the same amount of feed per revolution on all kilns.

13. Installed flap gates with flashers at discharge. The gates retarded any tendency to flood, and the flashes kept the kiln platform advised of the feed abnormalities.

14. Rebuilt the feed gates from bins to screws to aid accuracy of adjustment and locking when set.

15. Installed bin vents by connecting bins to feed pipe (insulated); the kiln draft kept the feed pipe clear and did alleviating without any disturbance.

The feed to the kilns was spilt 80 to 20. We fed 80 percent of estimated capacity by the right-hand screw with its own drive and motor. It was synchronized with the kiln motor, stopping, starting and feeding with the kiln. The left-hand screw was given its own motor and drive. It was interlocked with the kiln, to stop and start only with the kiln, but its feed was regulated by an interval timer located in a room on the firing platform.

An interval timer with 120-sec. division has a remarkable range of adjustments (plus or minus 50,000). Thus, by setting the timer, extreme accuracy of feed adjustment could be made by starting and stopping the left-hand screw only. This arrangement also loaded the two screws logically so that there was more regularity in their movement and much less prolonged stopping with either. There was approximately steady flow from each, and flooding or choking was avoided. At first, there was much tinkering with the timer on the first kiln. Finally, we put the five feed timers in a room on one end of the furnace platform. To change a timer was not forbidden, but to adjust it was a chore. As a result, they were practically never touched. There was a check on their use by the revolution counters, so if they were changed it was apparent.

Coolers were synchronized with the kiln to harmonize with reactions in the firing zone. This is

a more complicated matter and must be given special treatment.

Much study and experiment was attached to the best way to control the kiln draft. This, too, is a more complicated affair requiring special treatment, it being a function of kiln and cooler action and control.

We fired the kilns close to the hood for best results. This became remarkably more possible with constant speed, because they both benefit by better care and reduced oscillations.

Another train of events based on raw material knowledge and control and physico-chemical aspect had to be gone into and upgraded, but that part of the program would never have been a success unless the above main points were well started. They will be the subject of a separate treatment.

Editor's Note: Succeeding "Safaris in Cement" will appear in future issues of ROCK PRODUCTS

ROCKY'S NOTES

continued from page 24

states the objective thus: "One of the first jobs is to devise agreed and reliable methods of measuring mechanical properties. Then it becomes profitable to discuss in some detail the reasons for the observed behavior and, finally, it is necessary to get down to the explanation of the behavior on a molecular pattern. It is mainly the first two topics that are dealt with in these pages; the third is a much more difficult job that will be completed in time. The hope, however, is that by bringing together such diverse interests, a start will be made on the problem of dealing with brittle materials in a fundamental fashion by putting the subject on a sure foundation."

In his opening address, A. H. A. Wynn, member of the National Coal Board, said: "We are attempting in this conference to learn all that we can from those who have a long tradition of scientific study of the mechanical properties of brittle materials to help us with our study of coal and coal-measure rocks. The papers presented show how comprehensive has been the study of concrete .... Altogether there are reports on eight different substances." The conference included representatives from Holland, Germany, Belgium, France and Switzerland.

Our readers are naturally most interested in what representatives of the cement and concrete industries presented. These are interesting because, with few exceptions, they refer only to work done in Great Britain and on the Continent. There are very few references to American sources, pre-

Please turn page

ROCKY'S NOTES

continued from page 149

sumably because in our country notable progress has not been made along these special lines. The papers relating to the properties of concrete are: (1) The Failure of Concrete Test Specimens in Compression & Flexure, by Dr. R. Jones, Road Research Laboratory, D.S.I.R.; (2) The Elasticity, Creep & Shrinkage of Concrete, by Prof. A. D. Ross, Kings College, London University; (3) Effect of Rate of Loading on Some Mechanical Properties of Concrete, by Prof. R. H. Evans, Leeds University; (4) Some Exploratory Tests on the Strength of Concrete Beams Under Pulse Loads, by Dr. E. N. Fox, Cambridge University; (5) The Impact Testing of Concrete, by H. Green, Building Research Station; (6) Roller Bit Penetration Experiments in Concrete, by Dr. N. J. Price and Dr. R. Sheperd, Mining Research Establishment.

The summary of paper (1) states: It "formulates some ideas on the mode of failure of concrete test specimens in compression and flexure. Using an ultrasonic pulse method, precracking is shown to occur in concrete test cubes in compression at 50 to 70 percent of the failing load, depending on the type of coarse aggregate . . . . Precracking in flexure is discussed. It is suggested that the same mechanism is responsible for the precracking which occurs in compression and flexural specimens, i.e., primarily local bond failures between aggregate and cement paste."

In discussing this and other papers on compression tests, Dr. W. H. Walton (the editor) said: "Several of the papers have made it evident that the compression test is not as simple and basic a measure of strength as might appear at first sight. Its complexity is illustrated by the varied modes in which specimens fail." In other words, the British scientists were interested not merely in how strong, or what compressive stress the specimens would take (the common objective in strength tests), but what the mode of failure could reveal of the internal structure of the material.

However, this does not mean that results of tests made for simpler purposes are valueless in this enlarged view. The data in the paper on the elasticity, creep and shrinkage of concrete, for example, were developed some 16 to 25 years ago, but the author stated during the discussion: "The value and importance of those results concerning the modulus of elasticity of materials at low stresses were not appreciated until the dynamic methods of determining the modulus were available. At the same time, there is much in common between many of the other results in the paper and those obtained by research workers on some aspects of coal."

Please turn to page 152

EXPANDA-KRAFT (newest, high-strength H&W bag stock) stops a Johnny Unitas pass

Johnny Unitas, all-pro quarterback, throws fast and hard and straight. We asked Johnny to help us demonstrate the strength and resilience of Expanda-Kraft. He had two targets: regular multiwall kraft and Expanda-Kraft. Each target had four plies of 50-lb. stock. The speeding pigskin ripped through regular kraft, but time after time it bounced off Expanda-Kraft. The picture shows where the ball left dents in the Expanda-Kraft.

Multiwall bags made of Expanda-Kraft:

Reduce breakage—Expanda-Kraft bags have two-way stretch, soak up shocks that would break ordinary kraft bags of equal basis weight.

Stack securely—They stack with less risk of slippage and stay in place while in transit, because of improved friction coefficient when compared with regular kraft bags.

Withstand moisture—Weathering and high humidity have little effect. They stay tough. Firm.

Print sharp—Their attractiveness increases your product's sales appeal. Expanda-Kraft White is unusually bright and takes fine printing beautifully. Semi-bleached and Natural shades do, too.

Fill fast—Expanda-Kraft bags have high porosity. And they're rigid enough to stand up to high production speeds on the filling line.

Expanda-Kraft, made by a new roll-crepe process, withstood the terrific impact of these Johnny Unitas bullet passes. It combines rigidity and moisture resistance with uniform toughness. Expanda-Kraft is available to multiwall bag manufacturers in 40, 50, 60, 70 and 80-lb. basis weights. Expanda-Kraft bags have proved their superiority over regular kraft bags in standard drop tests.

Expanda-Kraft is superior to regular kraft in impact test. These bags were filled with sand, suspended on long ropes, released and collided in mid-air. Only the regular kraft bag burst, yet it had the same ply construction as the Expanda-Kraft bag.

Contact your multiwall bag supplier for more information. Or, write *Hollingsworth & Whitney, Division of Scott Paper Company, Chester, Pennsylvania.*

SAFEGUARD YOUR PRODUCT IN EXPANDA-KRAFT®

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HOLLINGSWORTH & WHITNEY DIVISION OF
SCOTT PAPER COMPANY

ROCKY'S NOTES

continued from page 150

Thus, the cement and concrete researcher may see that if his work is thorough and reliable, its usefulness does not end with its presentation to an interested group. It may well form the basis for new analysis and study of the whole science of material properties. Materials, like all other substance, represent a form of stored energy. There are methods and ways in which they release the energy that binds them into a whole. Until we know, and can predict these, we are not very far advanced in the science of materials. **END**

CONTROLLERS SWAP IDEAS

continued from page 146

should have been classed, in the eyes of IRS, as personal income.

In discussing the subject, Mr. Brady pointed out that every employe should have some personal record of his expenditures, for he may be called on to substantiate them even though he has reported in compliance. On company expenses, all items must be reported to the employer, including credit card charges. Mr. W. F. Bayne of Union Sand and Gravel Co. indicated that his company is concerned with the justification it has for deducting an item and how to record it. An adequate accounting for expenses of an employe to an employer is to answer the question of who, what, when, where and how much.

The best way to approach insurance coverage is dependent on an individual company's situation. Mr. S. James Campbell, Harry T. Campbell Div., Flintcote Co., described his company's history in insurance coverage which is now on a self-insured basis. It was thought that the company had a well-rounded program, but now a new phase in insurance has been entered. A lot of loop-holes have been found and are being removed.

Philosophy of his company is to not pick and choose where risks are great, but to be sure that there is adequate coverage of all risks.

Cost ratios in the ready-mixed concrete industry represent valuable information. This was the consensus of the group which suggested that the NRMCA continue to collect and compile similar data on an annual basis in the future. The Joint Committee on Fiscal Affairs also recommended that the cost-study information be made available to the trade press representing the industry and to legitimate organizations that make a request for the information through the Washington office. Mr. Ken E. Tobin of the Washington staff is responsible for collecting and compiling the data for the cost-ratio studies. **END**

PEERLESS keeps one eye on the blue pen . . .

And their kilns and waste heat boilers give 20/20 performance!

You see, the Peerless Cement Company of Detroit uses a Bailey Gas Analyzer-Recorder on each of three manually-operated 178′ kilns. On a single chart, the Analyzer-Recorder shows both percent oxygen (red pen) and percent combustibles (blue pen).

It's the "blue pen" that shows the *truer* picture of combustion conditions—overfiring or underfiring. And it's the burnerman's job to keep the "blue pen" on zero.

This *controlled* combustion gives the following results:

In kilns, improved stability of operation through maintenance of proper burning conditions, at very definite fuel savings.

In waste heat boilers. By keeping combustion in the burning zone of the kiln, and out of the boiler . . . reduced slagging, longer boiler brick life, more uniform water-level control, and reduced boiler tube erosion.

Your Bailey Engineer can help you plan for peak performance. Call him, or write for your Bailey Kiln Control Folder.

C 117-1

CEMENT DIVISION

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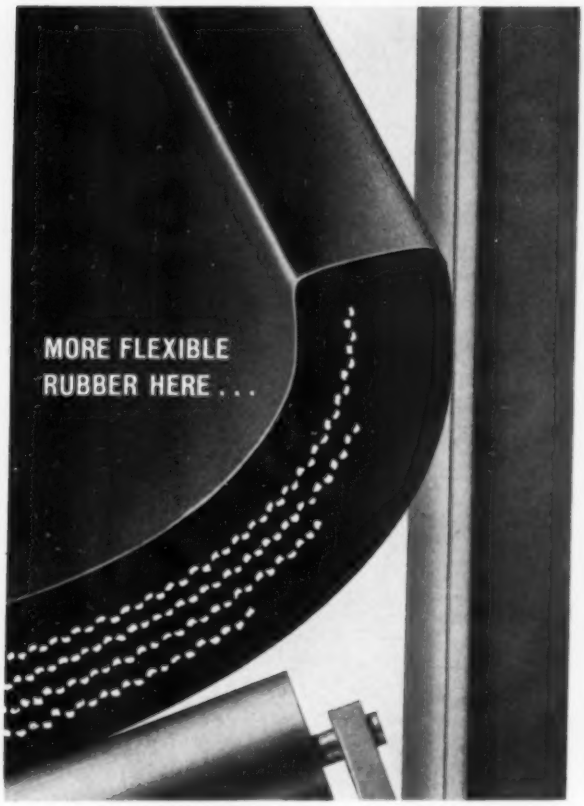
Quaker Thermoid

"COLEDGE" BELTING REDUCES EDGE WEAR, ADDS MILES OF USE!



Improper training can ruin a conveyor belt faster than any other abuse. Riding up and rubbing against a frame member soon wears away the stiff edge of conventional belting and exposes the carcass plys to moisture, mildew, dirt and eventual ply separation. "Coledge" belt construction was developed by Thermoid Division—to overcome this weakness and extend belt life.

"Coledge" construction puts plenty of extra rubber on the edges where it counts most . . . the plys are stepped back to make a more flexible edge that rides with the punches when misalignment occurs. This "Coledge" construction can put many extra miles on your system, especially in coal fields and sand and gravel pits where most belt failures are the result of excessive edge wear. Exclusive with Thermoid Division, "Coledge" construction is available in any standard type belt your application may require.

So, if you have an edge-wear problem with conveyor belts, specify "Coledge" construction. See your Thermoid Division industrial distributor for technical data or assistance, or write *Thermoid Division, H. K. Porter Company, Inc., 200 Whitehead Road, Trenton 6, New Jersey.*

THERMOID DIVISION PORTER **H. K. PORTER COMPANY, INC.**

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

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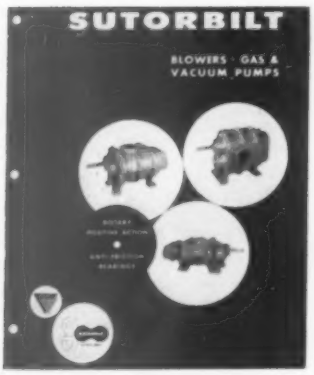
NEW LITERATURE

FOR FREE INFORMATION on these items, simply fill out and mail postage-paid Reader Service Card found elsewhere in this issue



Positive displacement blowers

SUTORBILT CORP. is offering a 12-page bulletin that explains this company's "California Series" of horizontal and vertical blowers and gas pumps that automatically provide a metered quantity of oil-free air at constant volume. The bulletin describes and illustrates the series of rotary positive blowers; the newly developed Series "B", with higher maximum speed ratings and greater outputs, and the Series XB gas pump. Complete dimensional information on all models and sizes is given by means of charts and drawings. The bulletin also lists two pages of performance data for low pressure, medium and high pressure units.

Enter 700 on Reader Card

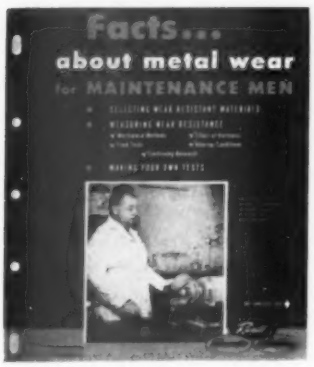
Deep trough idlers

LINK-BELT CO. has made available a booklet entitled "Deep Trough Belt Conveyor Idlers." The booklet contains selection data on 60 new 35-deg. deep trough idlers and 24 additions to the line of 45-deg. idlers. It is said that belt conveyors equipped with the 35- and 45-deg. idlers offer possibilities for economical handling of materials that formerly required the use of conventional 20-deg. idlers. The 45-deg. idlers are primarily designed to handle lighter materials, but can be applied to heavier materials.

The booklet contains capacity ratings and design information for 35-deg. idlers and lists 12 types of 35- and 6 new types of 45-deg. idlers for belt widths from 24 to 60 in., with steel, rubber cushion and positive action training rolls, equal and unequal length.

Enter 701 on Reader Card

Metal wear bulletin



RANKIN MFG. CO. has issued a bulletin (form 103) entitled "Facts About Metal Wear For Maintenance Men." Covered in this bulletin are such subjects as "Measuring Wear Resistance, Making Your Own Tests and Effects of Hardness."

Enter 702 on Reader Card

Solid lubricants booklet

THE ALPHA-MOLYKOTE CORP. has released a new booklet in which the theory and practice of lubrication by solids are the primary subjects. The booklet discusses boundary friction and the role of solid lubricants to reduce friction and wear under heavy loads and at high temperatures.

To answer the question of its title "What is Molykote?" the booklet goes on to discuss molybdenum disulfide lubricants, which are available in powder form, as greases, as resin bonded coatings, as dispersions, or in a variety of special forms. The company's research facilities, activities, in this country and Germany, are described.

Enter 703 on Reader Card

(Continued on page 156)

NEW LITERATURE

(Continued from page 155)

"Multiwall Packaging Guide"

BEMIS BRO. BAG CO. has published a new 16-page "Multiwall Packaging Guide" containing information on the basic types of multiwall bags, the principal types of multiwall bag closures, proper storage and handling of multiwall bags, railway car and truck trailer bag loading systems, and multiwall packaging equipment.

Enter 704 on Reader Card

Engine pamphlet

INTERNATIONAL HARVESTER CO. is offering a pamphlet which details 27 of the company's diesel and carbureted engines—in 4, 6 and 8-cylinder versions. Of the 27 units, which are available from stripped engines to complete power units, 10 are diesels, with two of 4-cylinder design and 8 of the 6-cylinder category. In the carbureted line, shown are two 4-cylinder units, 12 of 6 cylinders and three V-8 models. Horsepower ratings range from 16.4 to 385; weights from 279 to 6,045 lb.

Enter 705 on Reader Card

Tractor loader booklet

CATERPILLAR TRACTOR CO. has made available an 8-page booklet that describes the company's new tractor loader. Features of the new unit include a turbocharged engine with horsepower raised to 150 from 100, a new power shift transmisison coupled with a speed range selector to give four speeds forward or reverse, a dry-type air cleaner, and a hydraulic system producing 27 percent greater pry-out force than the company's earlier models. Bucket capacity of the tractor loader is 2½ cu. yd.

Enter 706 on Reader Card

(Continued on page 159)

USE ORDINARY KRAFT MULTIWALLS?

SEE WHAT YOU CAN SAVE WITH

New WONDERWALL™ Standard Bag Constructions

Fertilizer	Usual Saving: **$3.80/M** bags
Cement	Usual Saving: **$2.75/M** bags
Feed	Usual Saving: **$6.60/M** bags
Seed	Usual Saving: **$20 to $100/M** bags
Flour	Usual Saving: **$4.05/M** bags

In a WONDERWALL bag, fewer or lighter plies are needed compared to a natural kraft multiwall. Equally important, WONDERWALL withstands far more impact without breaking than conventional natural kraft multiwalls. Secret of WONDERWALL savings is in the "built-in" stretch of Clupak* extensible paper.

See how new WONDERWALL standard bag constructions can cut your costs, reduce bag breakage and increase customer satisfaction.

Mail coupon or call Multiwall Bag Division, West Virginia Pulp and Paper Company, 230 Park Ave., New York 17, N.Y.; 1400 Annunciation St., New Orleans 13, La.; and 555 Maple Ave., P. O. Box 2156, Torrance, Calif.

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*Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications.

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Gentlemen: Please send me more details on WONDERWALL bags. I now pack _____ (product)

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COMPANY _____

STREET _____

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Accurate to one ten thousandth of one percent. With this new "Direct Reader" Spectrograph, CF&I maintains extraordinary control over each melt of steel. Samples, taken from the blast furnace or open hearth, are sped to the lab via pneumatic tubes. In minutes, a complete spectrographic analysis is ready. This "controlled chemistry" means Grinding Balls and Rods that wear longer, grind more efficiently.

What CONTROLLED CHEMISTRY means in CF&I Grinding Balls and Rods

CF&I takes great care in the selection of steels used in its grinding balls and rods. For example, each size ball from the smallest to the largest (¾" to 5" diameter) must have the proper composition to give the best balance between hardness and toughness. CF&I's modern spectrographic equipment assures you balls with the correct chemistry in relation to their size. In fact, CF&I uses different steels, depending on the ball size required. This chemical control pays off in your mill because CF&I balls have greater resistance to abrasion, withstand impact, and grind at lower cost.

In grinding rods, CF&I observes similar standards. Special analyses of high carbon steels are hot-rolled and machine-straightened to close tolerances, from 1½" to 4" diameter in whatever lengths ordered. CF&I's controlled chemistry techniques result in grinding rods that have excellent wearing properties, resisting bending or premature breakage.

For the complete story on the advantages of CF&I Grinding Balls and Rods, get in touch with your local CF&I Sales Office.

OTHER CF&I STEEL PRODUCTS FOR THE CEMENT INDUSTRY
CF&I Mine Rail and Accessories • CF&I Rock Bolts and Relock Metallic Fabric
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In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

Enter 1427 on Reader Card

NEW LITERATURE

(Continued from page 156)

Rotary table feeder

CHAIN BELT CO., Conveyor Div., has announced the publication of an 8-page bulletin describing the company's standard rotary table feeders. The rotary feeders are designed for controlled feeding of sand, crushed ore and similar bulk materials providing an efficient method of metering material from vertical storage bins. It is said that they also allow constant, accurate control of the quantity of material fed onto conveyors and processing equipment.

The bulletin contains outline drawings, dimensions and specifications covering the three standard feeders available. It also features easy-to-read selection procedures as an aid in selecting the right model to meet specific needs.

Enter 707 on Reader Card

Data sheets on alloys

COAST METALS, INC. has issued a new series of data sheets which contain detailed information on alloys for abrasion, impact, corrosion and heat resisting services. Each sheet provides complete engineering data on a single alloy, including: the available forms, such as welding rod, automatic welding wire and cast shapes; physical properties and nominal chemical composition; typical applications, and recommended finishing procedures.

Enter 708 on Reader Card

Drilling equipment bulletin

GARDNER-DENVER CO. has made available a bulletin containing data and operating information on the company's complete line of crawler mounted drilling equipment. The bulletin offers information on drill carriers, drill feeds and various types and sizes of drills. Combinations of this equipment also are illustrated to show the right combinations for any specific drilling application. Construction features, operating features, specifications and other material is presented in pictures and diagrams.

Enter 714 on Reader Card

Loader catalog

J. I. CASE CO. has released a 16-page catalog that gives details on the company's 9,000-lb. capacity loader—a 4-wheel drive, rear-wheel steer unit for materials handling, mine and quarry work and land clearing. A "Fact Finder" index permits quick reference to the unit's features, including: improved balance and stability; heavier construction; power operation; economical diesel engine; and interchangeable buckets, with 1⅝ and 2½ (std.) and 3½-cu. yd. capacities. Other loader models in the line are shown and described.

Enter 715 on Reader Card

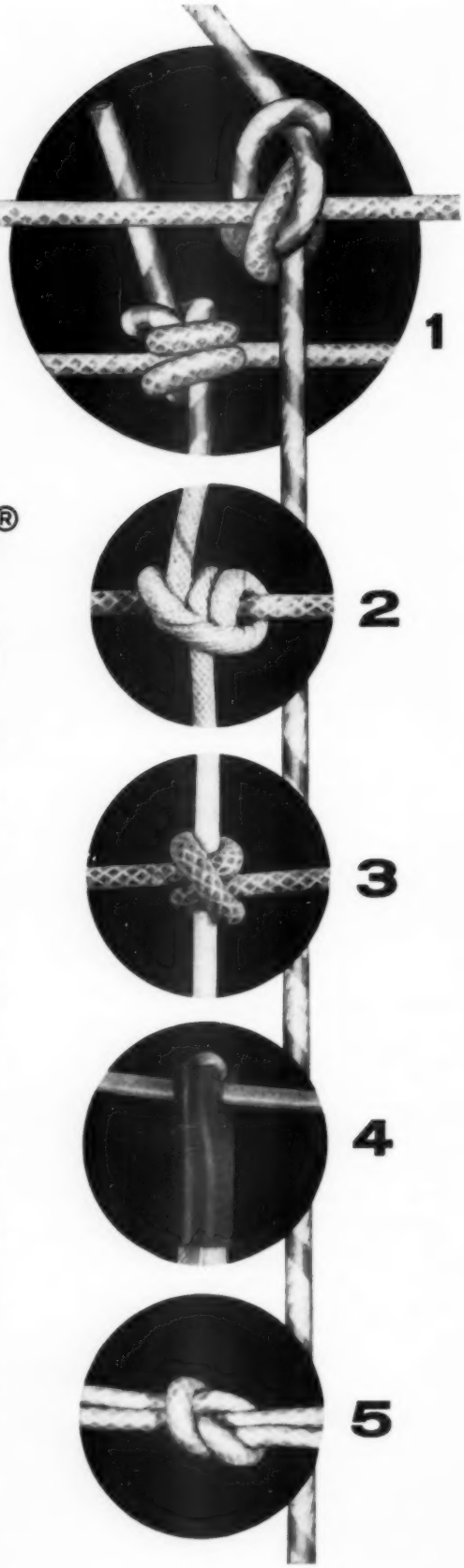
Federal Trade Comm. guide

THE FEDERAL TRADE COMMISSION has just issued a guide to the requirements of the Federal Statute (known as the Robinson-Patman Act) which prohibits the granting and receiving of improper advertising or promotional allowances in the promotion of sales of products. The provisions of the Act covered by the guide are, it is believed, little known in the rock products industry. The statutory provisions are themselves quite complex and difficult for the non-lawyer to understand. Therefore, since the guide is couched in layman's language, it should help members in approaching an understanding of the little known but important requirements of federal law.

Enter 716 on Reader Card

(Continued on page 164)

Always use tape to fasten the electric blasting cap (or fuse and cap) onto Primacord trunkline about six inches from end with the business end of the cap pointing in the direction of the blast.



FIVE PRIMACORD® CONNECTIONS

all tied for quick and easy blasting

Primacord is easy to use. Positive priming can be accomplished with simple connections, proved and recommended for the type and size of cartridge or "powder" in use. These can all be made at the hole. For positive hook-up, the downlines can be connected to the trunklines with simple half hitches drawn up *tight*.

1. **LOOP-LOCK HALF HITCH** is recommended when the downline cannot be tied easily. The loop-lock makes it impossible for the half hitch to slip off the end of the downline. Shown is Plastic Wire-Countered downline and Plain Primacord trunkline.
2. **DOUBLE HALF HITCH** is recommended when the downline is Reinforced (shown), Plain, or Lo-Temp® Primacord. It grips the trunkline, which in this case is Plain Primacord.
3. **SINGLE HALF HITCH IN TRUNKLINE** can be used when the downline is Plastic Reinforced (shown) or Plastic Wire-Countered. Place connection *at least 1 foot* from the end of the downline. Trunkline can be Plain (shown), Reinforced or Lo-Temp Primacord.
4. **PLASTIC CONNECTOR** is recommended when both downline (Plastic Wire-Countered) and trunkline (Plastic Reinforced) is of a type that does not tie securely.
5. **SQUARE KNOT** is recommended for trunkline connections when using Plain, Reinforced and Lo-Temp Primacord (shown).

Priming and hooking up with Primacord simplifies field work, reduces hazard, promotes economy and can give you the results you plan for.

P-1

The ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut • Since 1836

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79 WEST MONROE ST.

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RP-10-60

ROCK PRODUCTS
79 W. Monroe St.

OCTOBER, 1960
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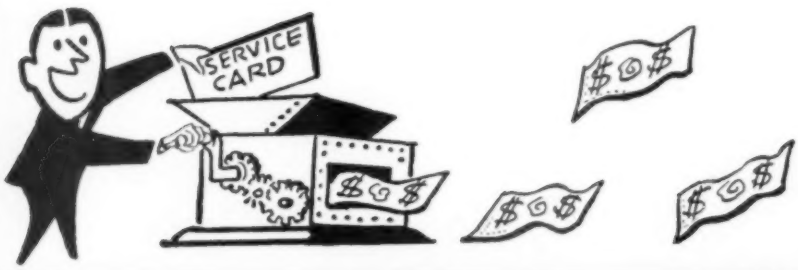
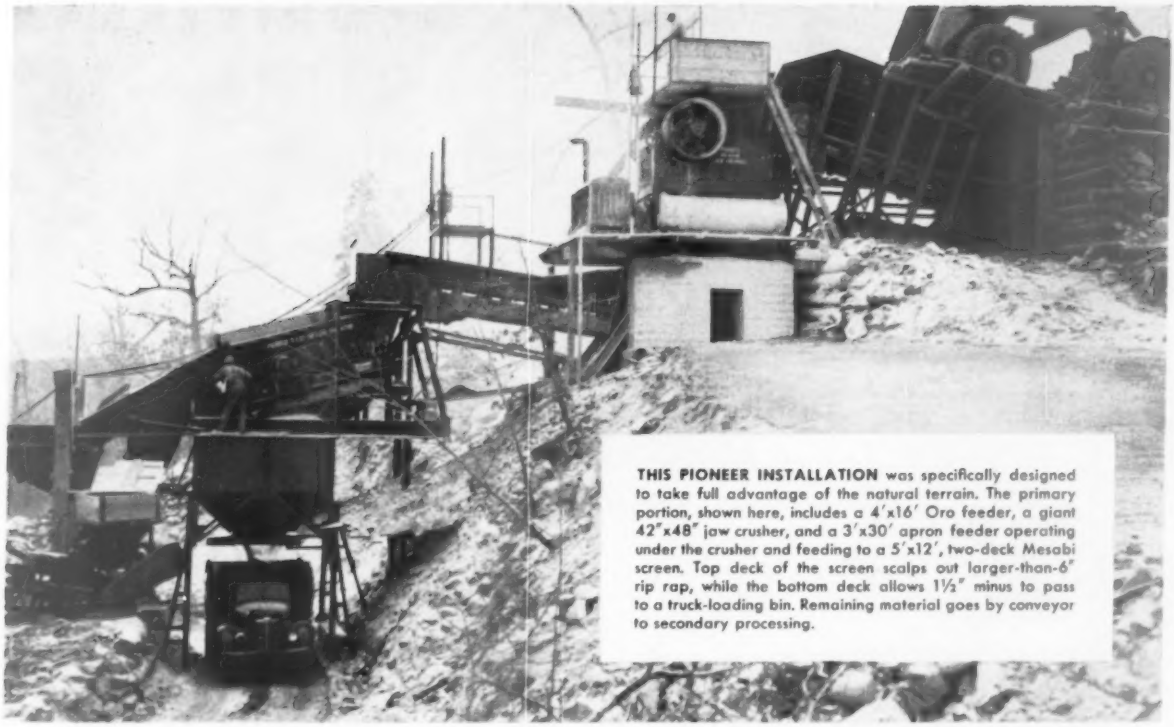
MONEY-MAKING IDEAS FOR YOU - - - FREE

HOW TO USE THIS SERVICE

1. **Advertised Products**
2. **New Machinery**
3. **New Literature**

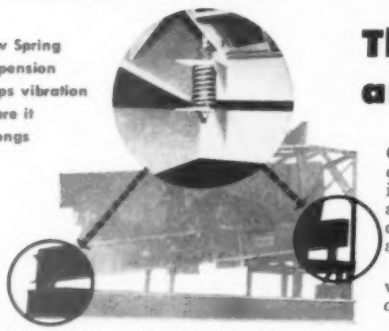
There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.





THIS PIONEER INSTALLATION was specifically designed to take full advantage of the natural terrain. The primary portion, shown here, includes a 4′x16′ Oro feeder, a giant 42″x48″ jaw crusher, and a 3′x30′ apron feeder operating under the crusher and feeding to a 5′x12′, two-deck Mesabi screen. Top deck of the screen scalps out larger-than-6″ rip rap, while the bottom deck allows 1½″ minus to pass to a truck-loading bin. Remaining material goes by conveyor to secondary processing.

New Spring Suspension keeps vibration where it belongs



(ABOVE) Dual sets of coiled springs at each corner of screen frame actually float the screen to prevent transfer of vibration to the supporting structure. This is *an exclusive feature* of PIONEER Vibrating Screens that increases screening efficiency while protecting the frame and structure.

There's only one "best" way to design an efficient stationary quarry plant

Overall design of an efficient stationary quarry plant calls for thoughtful probing in at least four important design areas: 1) installation cost, 2) plant components, 3) performance records, and 4) maintenance expense.

And when you get right up to the wire, you'll generally find there's really *only one best way* to design it.

Let's consider, for a moment, how PIONEER checks out in these areas:

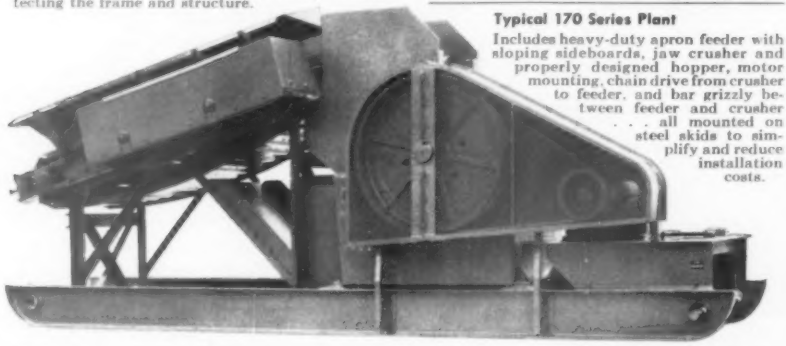
Installation cost. All major components are designed as completely integrated units to facilitate field erection. (See, for example, skid-mounted feeder and crusher shown at bottom left.)

Plant components. Construction of PIONEER Feeders, Crushers, Screens and Conveyors is based on improved design features that make them brutes for sustained strength and smooth operation. (Secondary spring suspension of vibrating screens is a typical example.)

Performance record. PIONEER heavy-duty feeders and overhead eccentric jaw crushers are more often specified for the really tough jobs than are other feeders or crushers.

Maintenance expense. PIONEER Plants are built to give long and satisfactory service under the most strenuous operating conditions and with an absolute minimum of maintenance.

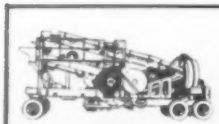
For all the facts, see your nearby PIONEER Distributor or write PIONEER ENGINEERING, Minneapolis 14, Minn.



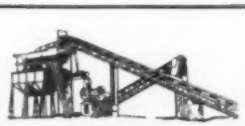
Typical 170 Series Plant

Includes heavy-duty apron feeder with sloping sideboards, jaw crusher and properly designed hopper, motor mounting, chain drive from crusher to feeder, and bar grizzly between feeder and crusher . . . all mounted on steel skids to simplify and reduce installation costs.

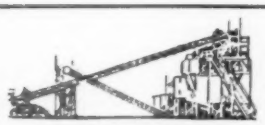
Pioneer®
ENGINEERING
DIVISION OF POOR & COMPANY, INC.



PORTABLE CRUSHING PLANTS



WASHING PLANTS



STATIONARY QUARRY PLANTS

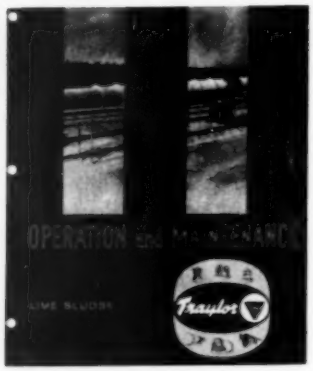
BITUMINOUS MIXING PLANTS

BITUMINOUS PAVERS

Enter 1426 on Reader Card

NEW LITERATURE

(Continued from page 159)



Rotary lime sludge kiln

TRAYLOR ENGR. & MFG. CO., Div. Fuller Co., has made available a 15-page illustrated brochure. The brochure covers operation and maintenance of the company's line of rotary kilns for lime sludge. Part I describes, with the use of numerous photographs, the process of operation including drying out, starting up, shutting down, kiln feed, kiln speed, sampling, combustion, instrumentation, exhaust system and records. Part II concerns preventive maintenance which includes: alignment, roller adjustment, drive, maintenance records and lubrication.

Enter 709 on Reader Card

Quarry truck

UNIT RIG & EQUIPMENT CO. has made available a bulletin describing the company's quarry truck. The illustrated bulletin includes details on the unit's horsepower utilization, maintenace cost, control and maneuverability. Explained and illustrated is the prime feature of the quarry truck—the motorized wheel drive. Also included in the bulletin are complete specifications and a dimensional layout of the machine.

Enter 710 on Reader Card

Automatic sampler

HARDINGE CO., INC. has issued a revised 8-page catalog describing its redesigned automatic sampler. The literature describes in detail the operating mechanism of the sampler and includes typical arrangements for both wet and dry processes. The sampler takes periodic "cuts" (or samples) from a stream of moving material at any stage in a continuous flow process.

Enter 711 on Reader Card

(Continued on page 166)

FULLER material-level indicators for bins and silos

For General Purpose and Hazardous Dust Locations

The Fuller Material-Level Indicator is a reliable high-level/low-level indicator that provides automatic control when a desired maximum or minimum level of material is reached.

The Material-Level Indicator automatically shows the level of pulverized, fine, crushed and granular materials—in a bin or silo—and readily "takes command" of such equipment as feeders, valves, elevators, and conveyors by starting or stopping equipment drive motors when a predetermined material level is reached.

Engineered and built for sustained operation over long periods of time, the sturdy Material-Level Indicator always registers true indication, regardless of momentary surges of bin material or the settling action of aerated, pulverized material.

Fuller Material-Level Indicator's Operation

A sensing paddle, located at the desired material level, is constantly rotated by a shaded pole induction motor located in the casing outside the bin or container. The motor and its reduction gears are mounted on an extension of the paddle shaft. Whenever material restrains the paddle from turning, the motor and its mounting revolve about the drive shaft, actuating two switches mounted on the base of the indicator.

When material falls away from the paddle, an adjustable tension spring returns the motor and its frame to the initial position, releasing the switches and causing the motor to turn the paddle again.

For high-level indication or control, the motor runs continuously until paddle rotation is impeded by the rising level of material.

For low-level indication or control, the paddle is restrained by the material and in turn restrains switches until the material falls below the paddle. When this happens, an adjustable tension spring returns the motor assembly to the starting position, releasing the switches and again starting paddle rotation.

Model SG-4 is designed for general purpose applications; SG-4 is UL approved for hazardous dust locations, Class I, Group D and Class II, Groups E, F, G.

Special adaptations for special applications are available. For full details write for Bulletin I-5-C.

FULLER COMPANY
GENERAL AMERICAN

FULLER COMPANY
102 Bridge St., Catasauqua, Pa.
Subsidiary of General American Transportation Corporation
Offices in Principal Cities Throughout the World

2636
I-9

Fuller
....pioneers in harnessing AIR

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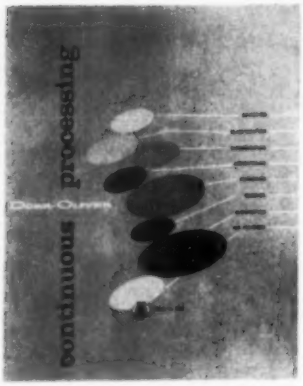
NEW LITERATURE

(Continued from page 164)

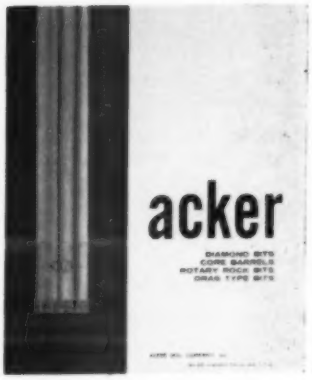


Continuous processing

DORR-OLIVER, INC. has made available a new revision of the 16-page brochure, "Continuous Processing", bulletin No. 7004. This revision illustrates and lists the distinguishing characteristics and applications of 55 types of continuous processing equipment manufactured by the company for: agitation, classification, lime slaking, thickening and clarification, pumping, and drying and dry classification.

Enter 712 on Reader Card

Diamond bits and core barrels



THE ACKER DRILL CO., INC. announces the availability of a 28-page bulletin, No. 10, describing its complete line of diamond bits, core barrels, rotary rock bits and drag-type bits. The new bulletin is illustrated with over 50 illustrations. Core barrels are illustrated in a sectional cutaway technique to expose internal detail and operation. In addition, the purpose and use for the various bits and core barrels is clearly described.

Enter 713 on Reader Card

END

Enter 1483 on Reader Card

A Mack B-873SX diesel takes on a load of phosphate rock. Both trailers are belt loaded simultaneously from pre-charged bins, and the 75-ton payload is loaded and rolling in just a few minutes. Entire unit weighs 200,000 lbs. . . . covers 11 miles of specially built road from mine to processing plant at a top speed of 50 mph.

MACK
for over 7 straight years
NO. 1
by far in sales of diesel trucks

This Mack takes on

75-ton payload in minutes

From the time Morrison-Knudsen Company, Inc., at Soda Springs, Idaho, rolls one of its big Mack-drawn trailer trains under the loader till it pulls away with 75 tons of phosphate rock, only minutes have passed. Making continuous cycles over the 22 miles between mine and plant on each shift, five of these big, fast units have stockpiled thousands of tons of ore in a four-month period for a year of plant operation . . . performed like clockwork, requiring nothing beyond the most routine maintenance.

Dependable, efficient, thrifty performance is built into every Mack truck through the exclusive Mack manufacturing practice known as Balanced Design. It assures you of the most efficient, economical, trouble-free truck, made possible by matching components so exactly that they function as a completely integrated vehicle for maximum mileage life. To achieve Balanced Design, Mack—alone in the industry—designs and builds more of its vital truck components than any other truck maker.

Mack offers a wide range of vehicles to fit every assignment that calls for dependable trucks. Phone or visit your nearby Mack branch or distributor for complete details. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

7640

MACK
FIRST NAME FOR
TRUCKS

NEW MACHINERY

FOR FREE INFORMATION on these items, simply fill out and mail postage-paid Reader Service Card found elsewhere in this issue

Pneumatic conveyors

A complete range of designs, styles and types of pneumatically operated vibrating feeders and conveyors is offered. The designs include flat and round bottom trays and tubular units ranging from 1 to 15 ft. long. Standard conveyors can be applied from 3 to 48 in. wide. Multiple units increase the conveying distance and flexibility of the installation to handle a large number of granular, free-flowing materials.

The pneumatic vibrator can be applied to grids, screens and grizzlies to perform a number of screening and scalping operations. Units of all types can be floor-mounted or suspended to meet operating conditions.

A typical conveyor will handle 50 tph. of sand and will use about 30 cfm. compressed air at 60 psig. Feeder output can be easily controlled simply by regulating the air pressure. (The Cleveland Vibrator Co., 2828 Clinton Ave., Cleveland 13, Ohio)

Enter 300 on Reader Card

X-ray analysis

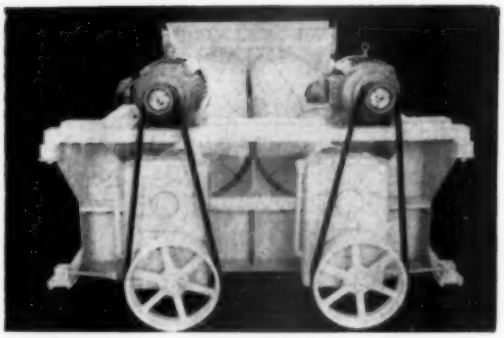
Fast, economical sample analysis of all elements above atomic number 11 (sodium) is now possible with a new laboratory instrument designated the Vacuum X-ray Quantometer. This instrument is ideal for rapid, accurate analysis of the elements in cement-making raw materials and in clinker analysis.

Primary feature of the instrument is an evacuated chamber in place of the helium-filled chamber normally used for analyzing elements lighter than calcium. Other features include compactness, efficient sample-handling devices, high optical speed and both fixed and scanning spectrometers.

The accuracy and precision of the VXQ analyzer are said to be equal to or better than conventional wet analysis techniques. At the same time, these lengthy procedures have been reduced from hours to a matter of minutes with savings in labor and money. (Applied Research Laboratories, Inc., P.O. Box 1710, Glendale 5, Calif.)

Enter 301 on Reader Card

Screw washers



A new line of single and double-screw washers offers the rock products producer more effective performance over a longer service life. These extremely versatile machines can be used to process a wide range of materials in addition to conventional aggregates: fine limestone, fine ores and special-purpose sands.

Outstanding features of the new screw washers include flexible operation to compensate for variations in materials processed or the requirements of the finished products. The overflow weirs can be adjusted to control the depth and velocity of overflow while the rotating speed of the screws can be readily changed. At the same time, the volume of incoming fresh water can be regulated.

Single-screw washers are offered ranging in size from 20 in. diam. and 20 ft. long to 44 in. by 33 ft. Double-screw units range from 20 in. by 20 ft. to 36 in. by 25 ft. (McLanahan and Stone Corp., Hollidaysburg, Pa.)

Enter 302 on Reader Card

Please turn to page 170

The new Bucyrus-Erie 30-R Rotary Blast Hole Drill gives you more feet of hole per dollar invested than any other drill in its class . . . and isn't that what you *really* want from a drill?

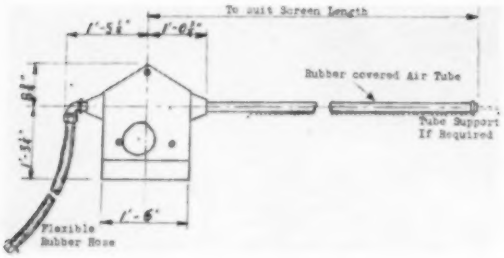
WHAT MAKES IT SO GOOD?

It comes naturally. The 30-R is patterned after two of the most popular and productive rotary blast hole drills in the business — the famous Bucyrus-Erie 40-R and 50-R. Its performance advantages include 30,000 lb pulldown force . . . continuous drilling for 21 feet, 3 inches before adding new pipe . . . infinite selection of speeds from 0 to 100 rpm . . . instant stabilizing and leveling with three hydraulic jacks . . . *plus* stamina that just won't quit.

Let your Bucyrus-Erie distributor show you many other reasons why the new 30-R is so good, or write Bucyrus-Erie Company, Dept. 1B60, South Milwaukee, Wisconsin, for descriptive literature.

BUCYRUS ERIE®

MOST RESPECTED NAME IN THE INDUSTRY



Prevents screen blinding

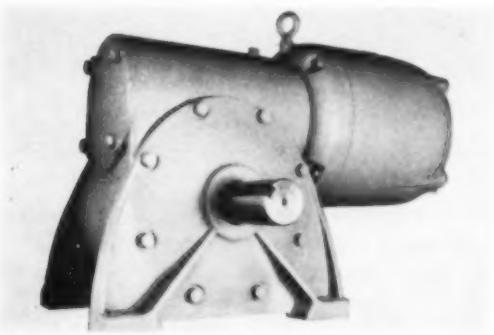
An ingenious new development uses compressed air to prevent screen blinding when doing fine screening of damp or wet materials. The Air Rinse device is said to maintain the screen's capacity when handling wet sand and to improve its volume of production of dry aggregates.

Full-scale production has shown that continuous production of 100 tph. of sand can be maintained on a 4 x 12-ft. vibrating screen with a raw feed between 15 and 20-percent moisture. To do this requires 250 cfm. of compressed air at about 65 psi.

The unit itself consists of a perforated pipe the full length of the screen cloth. The pipe is mounted on a manifold and the whole assembly shuttles back and forth the width of the screen to project compressed air up through the cloth. Pipe length and travel are determined by the dimensions of the vibrating screen. (Aussie Mfg. Ltd., P. O. Box 206, Richmond Hill, Ontario, Canada)

Enter 303 on Reader Card

Worm gear reducer



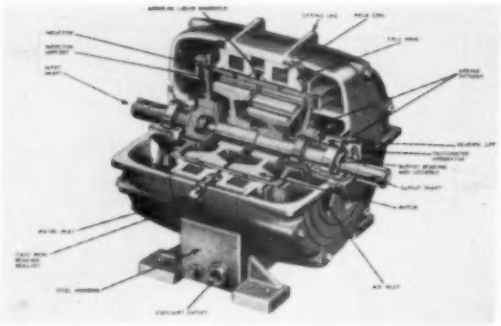
Latest addition to this manufacturer's line of worm gearmotors is an aluminum-housed unit with 6-in. backing. The new unit is available in ratios ranging between 10 to 1 up to 60 to 1, with torque ratings between 1,370 and 7,200 lb.-in.

Motors include 3, 5, 7½ and 10-hp. units as an integral part of standard foot-mounted, ring-mounted or the very compact shaft-mounted drive. These shaft-mounted reducers are obtainable to mount on shafts between $1\frac{11}{16}$ to $2\frac{1}{4}$ in.

The aluminum housings improve the thermal ratings of the drive by providing faster dissipation of heat. At the same time, the heat-treated housings provide greater strength and less weight, making it easier to support and to install the reducers. (Electra Motors, Inc., 1110 N. Lemon St., Anaheim, Calif.)

Enter 304 on Reader Card

Adjustable-speed drive



This maker's line of adjustable-speed drives has been greatly extended to cover the range between 75 and 4,000 hp. The new units are based on liquid-cooled magnetic coupling designs that feature few moving parts and a 20 to 1 speed range. They are available for a broad field of application, including pumps, blowers, feeders, mill and kiln drives.

Magnetic drives operate from an ac. power source and are offered as a complete drive package including controller enclosure and cooling liquid controls. Since the coolant does not contact the adjustable-speed member, there is no fluid friction on it. Closer, more uniform speed regulation results, according to the manufacturer. (The Louis Allis Co., 427 E. Stewart St., Milwaukee 1, Wis.)

Enter 305 on Reader Card

Submersible pump

A new submersible pump is available with a 1.8-hp. motor wired for 110-v., single-phase current. It is also offered for use with 220-v., single and three-phase current.

The new pump draws only 13 amp. when producing 85 gpm. at heads to 90 ft. so it is practical to use single-phase house current. Its outlet pipe is 1½ in. diam. (Flygt Corp., Hoosick Falls, N.Y.)

Enter 306 on Reader Card

Please turn to page 172

Six Marions Work Here

This 93-M 2½ yard shovel is one of six Marions which keep the rock rolling at a Pennsylvania cement plant.

Another 93-M, three Marion electric shovels built nearly 35 years ago and a Marion 362 diesel dropball complete the Marion equipment team at this busy operation producing in excess of a million tons a year.

The reasons why Marion is preferred equipment in many quarries, large and small, in many parts of the world deserve your investigation. Get the facts on today's Marion quarry machines - - today. Modern Marion electric quarry machines are available in sizes from 2½ to 10 yards.

CONSULT MARION MINING SPECIALISTS

for lowest costs on your property!

MARION POWER SHOVEL COMPANY - MARION, OHIO, U.S.A.

A Division of Universal Marion Corporation

continued from page 170

Pillow blocks

A low-cost mounted ball bearing is available with contact seals for light to moderate duty applications. The new L-series units feature spherical od. bearings mounted in malleable iron housings. This assures unrestricted self alignment even after mounting as well as strong, lightweight support for the bearing.

In addition to the pillow block design, the line offers both two and three-bolt flange units for either flush or recessed application. Shaft sizes range between $\frac{3}{4}$ and $1\frac{7}{16}$-in. diam. (Stephens-Adamson Mfg. Co., Ridgeway Ave., Aurora, Ill.)

Enter 307 on Reader Card

Single-phase motor

Single-phase motors are now available to rock products producers in totally-enclosed, fan-cooled housings. Sizes range from 1 to 5 hp. in standard speeds of 900, 1,200, 1,800 and 3,600 rpm.

The new motor has a number of features unusual in single-phase motors. These include a ribbed housing to dissipate heat rapidly, an internal fan cast integrally with the rotor, and an external centrifugal switch. This switch is the same for all sizes of motors in the group. It can be removed from the motor and replaced without disturbing the motor itself.

Stator parts are made of alloy steel and are keyed rigidly to the motor frame. Specially-designed coil windings keep internal connections to a minimum. (Brook Motor Corp., 3302 W. Peterson Ave., Chicago 45, Ill.)

Enter 308 on Reader Card

Bin vibrator

A novel approach to the problem of keeping fine materials flowing through deep bins is offered by this manufacturer. The simple assembly includes a vibrator mounted on a strip of steel that is suspended from the top of a bin or silo.

The steel is 18 to 24 in. wide and long enough to reach the zone of maximum material compression in the bin. Maximum length of the flexible strip is 50 ft. The vibrator is mounted near the top of the strip; its operation makes the steel undulate violently to disturb the forces tending to plug or arch the material in the bin.

The steel strip is suspended from an I-beam across the top of the storage bin. Normally, it is placed to put the strip down the center, but the location can be changed to achieve maximum flow of material through the bin. Off-center location will tend to prevent any build up of material on the sides and will keep this material moving to the discharge opening. (Syntron Co., 450 Lexington Ave., Homer City, Pa.)

Enter 309 on Reader Card

Crawler drill

A new self-propelled drill has been designed for one-man operation and mounts all equipment needed for blast-hole drilling in the rock products industry.

All equipment on the C66 Rotadrill is hydraulically operated, including top drive rotation, crawler drive, raising and lowering mast, outriggers and down-pressure rams.

Compressed air is supplied by a compressor rated at 600 cfm. at 100 psi. The entire production of air is used for clearing the drill hole since other equipment is hydraulically powered.

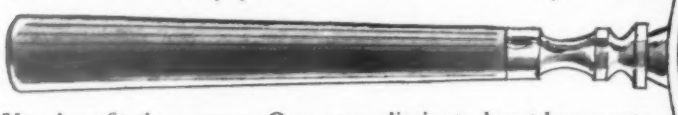
Two masts are offered, 25 and 35 ft. Each is fitted with a "Lazy Susan" pipe rack. Two track widths are available, 8 and 10 ft., with the 10-ft. width standard on units with 35-ft. mast. (Schramm, Inc., 900 E. Virginia Ave., West Chester, Pennsylvania)

Enter 310 on Reader Card

Please turn to page 174

ELEMENTARY...IT'S A EXTENSIBLE CLUPAK® PAPER* MULTIWALL BAG ...THAT'S WHY IT WON'T BREAK!

New CLUPAK extensible paper makes other papers old-fashioned . . . makes multiwall bags that stretch to take strain . . . absorb shock that causes bag damage. This increased toughness allows multiwall sack users to increase strength yet decrease the number of plies with resulting economies. Specify CLUPAK extensible paper multiwalls the next time you order.

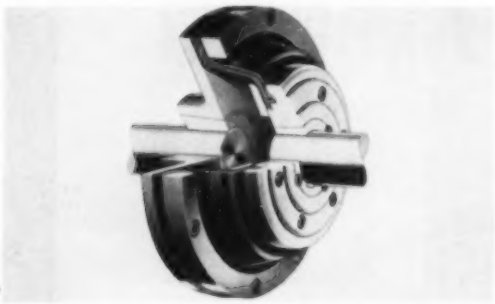


You benefit three ways. One, you eliminate burst-bag waste, because CLUPAK extensible paper absorbs shock . . . stretches instead of tearing. Two, you increase storage efficiency. CLUPAK extensible paper permits safe, clean, more compact stacking, less re-stacking. Third, you simplify on-the-job handling. Your workmen do not have to "baby" multiwalls made with CLUPAK extensible paper. The next time you order, say, "CLUPAK"... before you say paper.

*Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N. Y. 36, N. Y.

Enter 1424 on Reader Card

continued from page 172



Flexible coupling

Misalignment problems at high speed or high torque can be solved with a newly developed, cushion-type flexible coupling. The new coupling has been designed to operate at higher speeds and to transmit higher torque than previous couplings with a rubber-tired flexing member.

The new coupling can work with electric or internal combustion engines to drive pumps, compressors, fans, blowers and crushers. They are equally efficient on low-speed, high-torque drives. A range of sizes can deliver up to 47 hp. per 100 rpm. with shaft sizes ranging up to 4 in. diam. (Dodge Mfg. Corp., Mishawaka, Ind.)

Enter 311 on Reader Card

Low cost blasting agent

Nilite 101 is a low-cost, premixed, free-flowing blasting agent that has several advantages over conventional ammonium nitrate prills that must be mixed at the site, according to the product's manufacturer.

The new material is a nitro-carbo-nitrate blasting agent. It can be used in holes as small as 2 in. diam. to provide great uniformity in blasting. It is not cap sensitive and needs a primer to detonate it. The performance of delay blasting techniques is improved with the new blasting agent, according to the results of extensive laboratory and field tests. Nilite 101 is available nationally in 50-lb. bags. (E. I. DuPont de Nemours & Co., Inc., Wilmington 98, Del.)

Enter 312 on Reader Card

Flow-control switch

This new flow-control switch can be used either as a production control device or as a safety measure in conveying systems.

The device itself consists of two parts: a steel flap on a long rod and a 1-amp., 115-v. switch. The switch can be mounted on any convenient frame or support, while the rod can be extended into the flow of material in a hopper, feeder or conveyor. Angle of the flap in relation to the switch body can be adjusted through 360 deg. to actuate the switch from any position.

As a production control, the switch can sense the presence (or absence) of material and can initiate the operation of gates, feeders or production equipment. As a safety device it can be used to sound alarms, start or stop conveyors or to actuate other switches in the system. (Syntron Co., 450 Lexington Ave., Homer City, Pa.)

Enter 313 on Reader Card

Right-angle drives

A line of compact worm gear reducers is available with integral motors for right-angle drive applications. Using 1,800-rpm. motors up to 2 hp., reductions up to 60:1 can be achieved. The C-Flange reducers are offered with single or double-output shaft extensions for horizontal or vertical installations. (Morse Chain Co., Ithaca, New York)

Enter 314 on Reader Card

Blasting primers

A waterproof, insensitive primer is available for use with ammonium nitrate blasting agents. The specially cast, high-explosive primer is packed in three shapes in order to meet a wide range of blasting conditions.

Red Cap and Black Cap are 13-oz. containers, yet they give the power equivalent to 30 lb. of regular dynamite primer to initiate at least 300 lb. of ammonium nitrate. For small diameter holes, the 8-oz. Blue Cap package is ideal. (Austin Powder Co., Cleveland 13, Ohio)

Enter 315 on Reader Card

Refractory brick

A new super-duty refractory brick is reported to have exceptional load-bearing strength, excellent volume stability and great resistance to erosion and abrasion in cement and lime applications. Rockspar P-4 has been developed especially for the heavy-duty applications in the high-heat zones in kilns. With a fusion point above 3,000 deg. F., the new refractory shows no permanent linear change when tested by ASTM procedures. (J. H. France Refractories Co., 1944 France Rd., Snow Shoe, Pennsylvania)

Enter 316 on Reader Card

Please turn to page 176

Enter 1499 on Reader Card

Universal Single Rotor Two Hammer Portable Plant operating near the historical Cimarron River in Oklahoma. Averages 210 T.P.H., 100% crush in a primary crushing operation. Most of finished material is specification size — ready for the road.

HIGHER RATIO OF REDUCTION PER DOLLAR INVESTED

NEW UNIVERSAL PORTABLE SINGLE ROTOR IMPACT MASTER GIVES YOU MORE PROFIT PER TON

Universal Single Roll Impact Master in a stationary setup, Danville, Ky. Takes slab-by material without slow-up — produces at rates of 250 T.P.H. Write for story.

Powerful hammers smash infed rock with tremendous force and drive it against the Impact Master's grate. Sized material escapes immediately. In a single pass, high percentages of sized, cubical rock are ready for use. This greater tonnage of finished material means one thing to you — more profit per ton.

LOWER MAINTENANCE

The large expansion chamber permits clean breaking without rebounding. Results in less hammer wear . . . lower maintenance . . . dollars you can *pocket* instead of pay!

VERSATILE FOR SYSTEMIZED OPERATIONS

The Universal Single Rotor Impact Master is being used in primary, intermediate or secondary operations. Fit it where you need it most. Use it as a closed circuit crusher or with supporting units. It will increase your production.

CLOSE PRODUCT CONTROL

Easy adjustments permit close control of finished product to meet even the most rigid local, state and federal specifications. Many owners in areas across the nation will testify that the Universal Impact Master has come to their rescue after other crushers failed to meet specifications.

Get the complete facts from your Universal distributor or write for literature.

PETTIBONE UNIVERSAL
In Cedar Rapids Since 1906

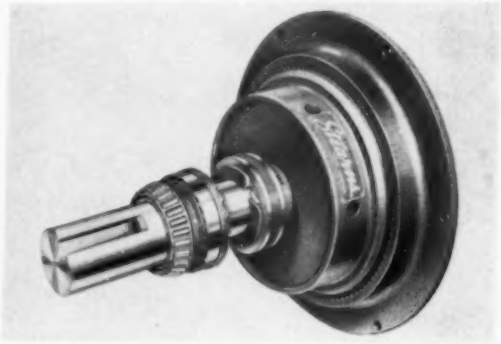
UNIVERSAL ENGINEERING CORPORATION

617 C Avenue N.W., Cedar Rapids, Iowa

A subsidiary of Pettibone-Mulliken Corporation, 4700 W. Division St., Chicago 51, Illinois

NEW MACHINERY

continued from page 174



Electromagnetic clutches

A new line of electrically energized clutches permits remote control of drives from panel boards or from other control stations. The powerful, compact units permit maximum efficiency in limited space.

The clutches are available in four sizes between 7 and 15 in. diam., and with one, two or three friction plates. Normally, the coils are wound for 90, 110 or 220-v. dc. current. Operating speeds can range between 400 and 1,300 rpm. to transmit up to 4,000 lb.-ft. torque. (Stearns Electric Corp., 120 N. Broadway, Milwaukee 2, Wis.)

Enter 317 on Reader Card

Faultfinder

Accidental grounds and faults in power systems now can be detected without shutting down the system. The new faultfinder imposes only 2 amp. on the circuit and cannot damage equipment on the line, according to the manufacturer.

The 18-lb. unit includes a cabinet, exploring cord and extension pole. It can be used with either ac. or dc. power systems up to 600 v. and has been designed especially for heavy-duty service in the rock products industry. (Parr Mfg. Corp., 44 Austin St., Newark, N.J.)

Enter 318 on Reader Card

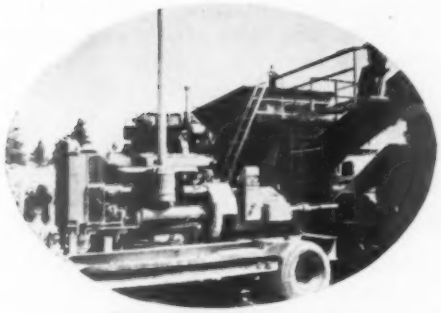
Plastic conveyor belt

A newly developed, synthetic fiber conveyor belt offers rock products producers a tough, flexible belt for heavy-duty applications. The material is named Vinylon—a polyvinylalcohol compound.

Exceptional strength, low stretch and excellent durability are offered with belts made with all-Vinylon fiber. Even greater superiority is available with special weaves of nylon and Vinylon to give tensile strengths up to 1,965 psi. (Bando Rubber Mfg. Co., Ltd., 1-2-chome, Meiwa-Dori Hyogo-Ku, Kobe, Japan)

Enter 319 on Reader Card

Please turn to page 178



Economize with

MURPHY DIESEL

Dependable Job-Site

ELECTRIC POWER

Murphy Diesel Mech-Elec Unit (upper left) supplies electric and mechanical power simultaneously or separately for a portable aggregate plant in the East.

Murphy Diesel Generator Set (left) provides inexpensive dependable electric power for a portable asphalt plant in New Hampshire.

Murphy Diesel Generator Set (below) reduces power-plant maintenance costs on an all-electric scalping plant in South Dakota. A 121 KW Murphy powers the plant.

Whatever *your* job, Murphy Diesels' economical operation and dependability for heavy-duty service keep costs low and profits high. Ask your Murphy Diesel Dealer about the advantages of Murphy Power for your plant.

PUTS MORE POWER INTO THE JOB

MP Series Murphy Diesel engines and power units are available in sizes from 105 to 320 HP with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 60 to 188 K.W.

MURPHY DIESEL COMPANY

5315 W. Burnham St., Milwaukee, Wisconsin

SALES . . . PARTS . . . SERVICE

Throughout the Nation

Enter 1466 on Reader Card

NEW MACHINERY

continued from page 176

Rigid coupling

There are a number of power transmission applications where the torsional "give" or the misalignment capacity of flexible couplings is neither necessary nor desired. For these uses rigid couplings often provide the best answer.

This manufacturer offers his line of No. 44 Sure-Grip rigid couplings with tapered bushing shaft clamps as an integral part of the coupling. These clamps overcome one of the major difficulties of conventional rigid couplings, that of securing the coupling to the shafts it couples. The tapered bushings provide the equivalent of a shrink fit on the shafts when they are tightened into the sleeve part of the coupling. Precision machining of the unit assures that the two shafts are exactly aligned when the bushings are tightened. Five sizes are available, ranging from ½ to $5\frac{7}{16}$-in. shaft diameters. (T. B. Wood's Sons Co., 5th Ave., Chambersburg, Pa.)

Enter 320 on Reader Card

Rust remover

Rust can be removed from the smallest precision parts to the largest structural member with Cor-O-dex, a new rust remover. The solution can be applied by brush, spray or immersion and is said to be equally effective on nickel, aluminum and stainless steel, as well as carbon steel and iron. Metal is left clean and rust-resistant after application of the new compound, while rust and corrosion is dissolved without dimensional changes to the parts. (Allied Products Co., 1133 W. Newport Ave., Chicago 13, Ill.)

Enter 321 on Reader Card

Primer-initiator

This new, compact package of Saf-T-Boost Initiator replaces 60 percent dynamite as an initiator for ammonium nitrate blasts. Clean, safe and easy to handle, the 13-oz. package permits quick threading of a 50-gr. firing cord. This small, handy package delivers a detonation velocity of over 20,000

ft. per sec. to assure positive detonation of the ammonium nitrate.

Unlike conventional dynamite, the new initiator does not become hypersensitive at freezing temperatures. It withstands the roughest treatment without detonating. The maker claims that this primer replaces a 30-lb. dynamite primer to give superior results at half the cost. (Propellex Chemical Div., Chromalloy Corp., P.O. Box 187, Edwardsville, Ill.)

Enter 322 on Reader Card

Laminated tire

The newest tire in this manufacturer's line is one of the largest made. This is a 12.00 x 24 heavy-duty nylon tire that will find application on big tractor shovels and portable crushing and screening equipment. Laminated tires find their most economic application on equipment working under rugged service conditions. Each tire can withstand up to 15,000 lb. and give traction to operate machinery on rough ground or over sharp rock. (Mitchell Industrial Tire Co., Inc., 1400 E. 40th St., Chattanooga, Tenn.)

Enter 323 on Reader Card

Hand winch

A new portable winch features light weight and high capacity. The 100-lb. machine can be mounted in any convenient position to serve as a conveyor boom hoist, car puller or winch. The drum can accommodate wire rope ranging from ¼ to ⅝ in., and one man can operate the unit to produce up to 4,000 lb. pull.

The Model 2-T hoist features a spring-loaded ratchet to prevent reversal of drum rotation when pulling. A double-acting band brake permits controlled lowering or control of drum rotation when the pawl is released. (Sagsen Derrick Co., 3101 W. Grand Ave., Chicago 22, Ill.)

Enter 324 on Reader Card

Portable truck scales

Latest addition to this manufacturer's line of portable truck scales is a unit with a capacity of 100 tons. This portable scale can be supplied with platforms up to 80 ft. long and 14 ft. wide to handle the big haulage rigs now widely available in the rock products industry.

Like the others in the line, the new scale is of all-steel construction throughout. It can be loaded and moved to another location in a matter of minutes and needs only inexpensive timber supports, concrete beams or a simple concrete slab for satisfactory mounting in the new location. (Cardinal Scale Mfg. Co., P.O. Box 151, Webb City, Mo.)

Enter 325 on Reader Card

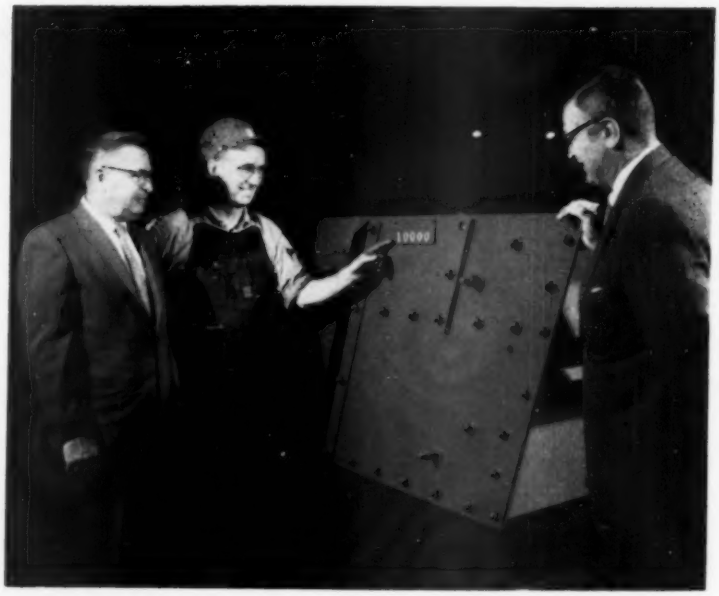
END

MANUFACTURERS NEWS

Hewitt-Robins to acquire chain company

HEWITT-ROBINS INC., Stamford, Conn., and Union Chain & Mfg. Co., Sandusky, Ohio, announced that the boards of directors of both companies have approved the acquisition for Hewitt-Robins common stock of the assets of Union Chain, subject to approval by the stockholders of Union Chain. Hewitt-Robins' line of industrial products includes material handling and processing equipment, conveyor belting, industrial hose and power transmission machinery. Union Chain manufactures conveyor and power transmission chain and sprockets.

In announcing the acquisition, Austin Goodyear, president, stated that Hewitt-Robins plans to operate Union Chain as a division, with E. F. Emmons, now president of Union Chain, heading the newly established division as its president.



THIS 10,000TH ALLIS-CHALMERS vibrating screen is being viewed by (from left) J. E. Dunn, screen engineer; Joseph Gerlich, assembler of screens, and E. H. Baxa, manager, processing machinery dept. This company has been supplying industries with rotary screens for more than 75 years, and vibrating screens since 1930. These screens range in size from a 35,000-lb. unit capable of processing 1,800 tons of limestone an hour to a 9 x 12-in. laboratory model.

Nordberg opens new office

TO PROVIDE BETTER SERVICE to users and prospective users of crushers, screens and process machinery, Nordberg Mfg. Co., Milwaukee, is making these changes: the establishment of office facilities in Dallas, Texas; the appointment of Eugene T. Daum, left, as sales engineer in the new office, and appointment of W. R. Neil Currie as sales engineer assigned to the St. Louis office. The news was made known by J. B. Bond, manager of the Mining, Crusher and Process Machinery Div.

Mr. Daum will headquarter in Dallas and cover the states of Texas, Oklahoma, New Mexico, Colorado and part of Western Kansas. Formerly a sales engineer in the St. Louis office, he has earlier been an assistant sales engineer at the Milwaukee office. Mr. Currie was for the past five years a sales and service engineer in other allied fields.

Ford expands sales

A MOVE TO EXPAND its sales in the light industrial equipment market was announced by Ford Motor Co., Tractor & Implement Div., Birmingham, Mich. L. E. Dearborn, general sales manager, disclosed that the division is:

(1) Establishing an expanded industrial sales organization directed by an assistant general sales manager;

(2) Adding the line of products previously manufactured by Sherman Products, Inc., whose acquisition by Ford became effective in July of this year;

(3) Selling components and complete products to original equipment manufacturers for inclusion in their products or sale through their normal distribution channels.

Named assistant general sales manager, Industrial Products, is J. B. Nicolls, Jr. Three newly created departments will report to him: Original Equipment Manufacturers' Sales, F. W. Conover, manager; Ford Industrial Sales, Harold Hanke, manager, Allied Equipment Sales, W. Howe, manager.

(Continued on page 182)

consistently

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grinding efficiency

It's something you can depend on with Moly-Cop Balls. Their performance never varies because Sheffield alloying, forging and heat treating are kept invariable by Sheffield quality control. They keep their spherical shape longer because their uniformity of fine grain structure goes right to the core. That means a better grinding job, and greater economy.

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SHEFFIELD DIVISION

Sheffield Plants in Kansas City, Tulsa and Houston

ARMCO STEEL CORPORATION

OTHER DIVISIONS AND SUBSIDIARIES: Armco Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

Enter 1464 on Reader Card

(Continued from page 180)

Madsen moves to Lima

H. F. BARNHART, vice president and general sales manager of the Construction Equipment Div., Baldwin-Lima-Hamilton Corp., has announced the transfer of all manufacturing operations from the division's Madsen Works, LaMirada, Calif., to the Lima Works, Lima, Ohio. The move was effective September 30, 1960. The Lima Works builds cranes, shovels, draglines and aggregate crushers; Madsen specializes in asphalt plants, dryers and dust collectors.

A Lima-Madsen engineering staff, sales office and service-parts department will be combined with Lima's present office at 14120 E. Rosecrans Ave., LaMirada. This move is part of a program to consolidate plant facilities and eliminate duplication of manufacturing efforts.

New addresses

THE RAYMOND DIV., Combustion Engineering, has moved its offices from the Goose Island Industrial District to a more central location within the Chicago loop area. The new home office, which will be headquarters for the sales and engineering departments, is in the Butler Bldg., 427 W. Randolph St., Chicago 6, Ill.

● The continued growth of Western Knapp in the midwestern and southern states has dictated a move of the company's central district office to larger and improved facilities. The new location of the central district office is 205 W. Monroe St., Chicago 6, Ill.

Pring manager at Dracco

ROBERT T. PRING has been appointed to the newly created post of manager, dust collector sales at Dracco Div. of Fuller Co., Cleveland, Ohio, manufacturer of dust control and pneumatic conveying systems. Mr. Pring will direct sales and marketing activities for the company's line of dry dust collection equipment and systems. He will guide departmental efforts toward expanded sales of an air pollution weapon that collects hot, corrosive dust and fumes.

New plant for Hercules Powder Co.

CONSTRUCTION OF A NEW PLANT by Hercules Powder Co. for the manufacture of commercial explosives, at Gilbert, Minn., has been announced by C. T. Butler, director of operations for the explosives department. The plant will produce a new-type explosive, especially suited to blasting taconite and various other hard-rock formations.

At the same time, Mr. Butler named J. E. Wommack, Jr., to be plant superintendent at Gilbert. Mr. Wommack has been dynamite department supervisor at Hercules' Bessemer, Ala., plant. He joined the company in 1936.

(Continued on page 184)

"Put SECO to work on your toughest screening job!"

Says Mr. GUY COOLIDGE
Superintendent, Putnam-Hawley
Building Materials, Inc., Potsdam, N. Y.

"We did, and we are not only sold on the increased production results, but with the low maintenance factor as well.

Our graded production runs a full 170 T.P.H. in five rigid classifications; three finished gravel grades plus mason and concrete sand . . . And on all five, we're meeting specs of the New York State Highway Department.

Even the wire cloth lasts longer . . . We've had fewer changes than ever before. But when replacement is necessary, downtime is at a new low with SECO's fast-securing method."

Mr. Coolidge's enthusiasm is shared by hundreds of other profit-wise aggregate producers from coast to coast. They are sold on the SECO TWIN-BEARING screen's year round productivity potential and day-in, day-out operating dependability.

You will be, too. Make your next vibrating screen investment a profitable one . . . make it SECO TWIN BEARING.

REQUEST SECO BOOKLET TB-21

SCREEN EQUIPMENT CO. Inc.
BUFFALO 25, NEW YORK

SECO
"TIME CONSCIOUS" VIBRATING SCREENS

Enter 1463 on Reader Card

(continued from page 182)

Cohart 104 now in cement industry

EDWARD C. LEIBIG, president of Cohart Refractories Co., Louisville, Ky., announced that Cohart 104, a fused cast basic refractory, is being introduced in the cement industry as a liner for hot zones in kilns. The material was developed in 1957 for use in electric furnaces and other steel manufacturing applications requiring high resistance to corrosion and elevated temperatures. This refractory lining has been tested in several cement production units and it is said that the tests indicate substantial increases in hot zone life compared to performance of conventional basic refractories.

New plants for Chain Belt

ORGANIZATION OF TWO NEW manufacturing corporations to further expand its international operations has been announced by Chain Belt Co., Milwaukee, Wis. The two new companies are Rex-Hunnebeck G.m.b.H. in Germany and Rex-Mafersa, S.A., in Brazil. It was also reported by O. W. Carpenter, Chain Belt president, that the company's foreign sales firm, Rex International, S.A., will shortly open a European branch office in Belgium and expand the territory of another office in Puerto Rico.

Rex-Hunnebeck, the new corporation in Germany, will produce Rex construction machinery equipment for the European market, exclusive of the British Isles. The new firm in Brazil will manufacture construction machinery for the Brazilian market and, eventually, for other South American countries.

Link-Belt sales in Italy

LINK-BELT SPEEDER CORP.'s shovels and cranes will soon be manufactured in Italy for sale there and in other Common Market countries, Robert C. Becherer, president of the company, announced. The firm of Orenstein & Koppel of Milan has been licensed to manufacture and sell the company's shovel cranes in Italy, and to sell them in other countries through Link-Belt, S.A., of Geneva, Switzerland. Sr. G. M. Manes of Milan is president of the Italian firm which manufactures a wide range of excavating and construction equipment.

Gar Wood appoints Hicks

APPOINTMENT OF W. Glen Hicks as sales manager, trailers, has been announced by D. J. Davis, director of sales, Gar Wood Industries, Inc., Wayne, Mich. Mr. Hicks joined the company in 1952. As a project engineer, he was responsible for the design of the company's "Mono-Shell" hopper trailers, a new design concept that increases payloads through elimination of braces and truss frames. Mr. Hicks directed the marketing of the new trailers to contractors and haulers in the West. In his new position, Mr. Hicks will be responsible for the national marketing of all the company's hopper and end dump trailers.

END

SPEAKING of OPERATIONS

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Ready Mixed Concrete

By

James A. Nicholson

Now get the *inside story* on the fastest-growing industry in the world. READY MIXED CONCRETE contains 10 sections and 40 chapters of know-how for organizing a new business or improving an established one. James A. Nicholson, recognized authority in the field, covers every facet of successful operation . . . from maintenance to merchandising . . . from front-office management to labor and customer relations. Send today for this powerhouse of interesting, informative reading.

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PHOTO ON LOCATION BY EHRENBER

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ABP BUSINESS PAPER LEADERSHIP — ABC AUDITED PAID CIRCULATION

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You may find just what you're looking for in the used equipment, employment and professional advertisements below. Box numbers are confidential and advertisers' names will not be disclosed. Send replies to: Box Number (shown on ad), c/o ROCK PRODUCTS, 79 W. Monroe St., Chicago 3, Ill. All replies will be forwarded to advertisers daily.

LIQUIDATING

1—Allis Chalmers SS rotary dryer, 6' x 50', complete with drive, motor, fans and blowers.

2—Louisville SS rotary dryers, 8' x 50', complete with drives, motors, fans, blowers, etc.

1—Traylor 11' x 155' rotary kiln, 2 tires, welded ⅞" shell, complete with drive and motor

1—Louisville rotary steam tube dryer, 8' x 45'

1—Rotary dryer 7' x 60', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary 6' x 64', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary dryer 6' x 56', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary dryer 6' x 50', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary dryer 6' x 35', 2 tires, ½" shell, complete with drive, motor, blowers and all auxiliary equipment

1—Steel ball mill 7½' x 7', complete with full charge of steel balls and drive

1—General American 7' x 40' rotary dryer, ⅜" welded shell, complete

1—Bartlett & Snow Lab. Calciner, 6" x 7'

10—Pacific vertical feed water reciprocating pumps, 10 GPM to 340 GPM, 80' head to 175' head, complete with motors

1—Dorr Type DSFR—2 classifier, 3' x 20'6" x 2½" slope

1—Hardinge pilot size ball mill, 24" x 8", complete

1—Patterson rod mill, 4' x 11'6"

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Cedarapids 40x22 Roll Crusher
Sturtevant #1 & #1½ Rotary Crushers
Acme Jaw Crusher 14x26, Steel Frame
New England Jaw Crusher 14" x 28"
Good Roads Jaw Crusher 10x30
Farrel Jaw Crusher 36x18
Farrel Lab. Jaw Crusher 6" x 2"
Denver Lab. Jaw Crusher 3¼" x 4½"
Jeffrey Hammermill 30x25, A-2
Pennsylvania Hammermill 30x24, M-2
Colorado Iron Ball Mill 6x4
Traylor Ball Mill 6x8
2—Lancaster "Iroquois" Pug Mills
Iowa 25 Yd. Portable Crushing Plant
Elevator and Sand Drag Chains
12" and 14" Elevator Belt 8 Ply
500' 9" Screw Conveyor Complete with Ends, Hangers, Gearmotors.
24" x 95' Truss Frame Conveyor Complete with Walkway, All New.
Head & Tail Assembly 42" Conveyor, Roller Bearing, Almost New.
Jeffrey Traylor #4 Vibrating Feeder with controller.
New Holland Plate Feeder 24" x 60"
30" x 32" Magnetic Pulleys
24" Magnetic Pulleys
22" Magnetic Pulleys
14" and 16" Used Rex Idlers
20" Roller Bearing Trough Idlers
30" to 48" Used Robins Idlers
Aggregates 4' x 10' Triple Deck Screen
Roball 20" x 76" Double Deck Screen
Niagara 4' x 14' Single Deck Screen
Niagara 2½' x 12' Single Deck Screen
Selectro 2x6 Single Deck Screen
New Universal Screens in Stock
Heatherington Dryer 6' x 32' 50 H.P.

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Essex 3-8105

QUALITY EQUIPMENT AT REASONABLE PRICES

2 Sturtevant Stainless Steel 30" MICRONIZERS w. accessories
Hardinge Conical Ball Mill, 36"x8" Air Swept; complete
Oliver Pressure Precoat Filters 5'3" x 3' and 5'3" x 8'
Crushers, Hammer Mills, Raymond Imp. Mills, Ball Mills, Screens, Rotary Dryers, Kilns, Presses

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ST. 8-4672 Cable: "Effemcy"

FOR SALE OR RENT

2½ Yd. Link-Belt K-595 Crane. 140' Bm.
35/40 Ton Industrial Brownhoist #8. Diesel Loco. Crane. New 1951.
40/50 Ton American #508 Diesel Loco. Crane. New 1942.
25 Ton Ind. BH. #5 Diesel Loco. Crane.
50 Ton American Stiffleg Derrick and 3 Drum American Hoist.
45 Ton Gen. Elec. Diesel Elec. Locos.
25 Ton Gen. Elec. Diesel Elec. Loco.
1 Yd. Lorain L-50 Crane. New 1951.

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1905 Railway Exchange Bldg., St. Louis 1, Mo.
CHestnut 1-4474

SPECIALS: Johnstone Ore Mill w/densifier, log washer, cone etc. Sulphuric Acid Contact Plant. 8' Raymond dbl. whizzer Separator.
PLANTS: 200 TPH static. Quarry Plant
CRUSHERS: 1020, 1036, 1524, 1536, 2036, 2436, 2540, 3042, 3642, 4240, 4860 **JAW.** 6K, 10K, 12N, 322R, 530, 636, 848R Allis. 25½ & 37½ KVS, 20" McCully GYR. 3' Symons std. & s/H. 36" & 48" Telsmith **CONES.**
DRYERS: 3x15, 4x20, 5x24, 6x50, 8x70, 8x125 2-24"x30' dbl Log, 30"x18' dbl screw **WASHERS**
FEEDERS: 3x8, 3x10, 3x15, 42"x12' Apron
MILLS: Raymond 5047, 5057 Roll. Dixie 3630, 3650, 5060, Williams #30 & 40 Hammer. Raymond #50 Impact. Bradley Sr. 4x6, 5x9, 5x10, 5x17, 5x21 8'x36", 8'x48", 10'x48" Ball.
CONVEYORS: 18"x135', 24"x115', 30"x60', 60"x300' Browning WB2 Wagon. Lorain TL20 **CRANES** Barber Greene 44C Ditcher. **LOADERS.**
SHOVELS: NW6, 25, 80D. Link Belt LS50. Lima 34, 604, 1201. Manitowoc 4500. Lorrain 820. Marion 93M, 111M, BE38B, 54B, 170B 150 FC 8t. Regis Bag Packer.

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¾ yard Lorain Model TL-25-K dragline with 40" boom, 22" shoes

Koehring 205 crane	120TM Hopto on Chev. truck	120 Hopto on F5 Ford truck
Vermeer 524T ditcher	Lima #34 Paymaster backhoe	4x10 Telsmith d.d. screen
Link Belt LS85 shovel	Lorain L41 ¾ yd. dragline	Terratrac 500 w/backhoe
Mod. J. Quickway backhoe	Minn-Moline UTI 1 yd. loader	360 Hopto on 6x6 Army carrier
P&H ½ yd. Clamshell 150	Hoe attach. for Koehring 304	Insley K-12 backhoe & dragline

This equipment rebuilt in our modern plant by expert mechanics. Come see it!

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Cedarapids 2540 Jaw Crushing plant.
Cedarapids 2236 Primary Jaw Crushing plant.
Cedarapids Portable Screening Unit.
Kennedy 37½ Gearless Gyratory.
Cedarapids 3633 Hammermill. Remanufactured.
Cedarapids 2033 Hammermill. Rebuilt.
Cedarapids 16' open inclined bucket elevator.
Cedarapids 4'x12', 2-deck screen.
Telsmith 3' x 8', 3-deck inclined screen.
Aggregates 4' x 14', 3-deck inclined screen.
54" dia. x 33' lg. revolving screen.
Cedarapids 30-B, 3-compartment charging hopper. New.
Smithco 10-Yd. Portable Charging Bin.
Wemco 48" x 23'3" Sand Preparation Machine.
Eagle 10' x 24' Scalping Tank.
Cedarapids 60" x 10' Scrubber.
8' x 12', 8' x 18', 12' x 22' bins in stock 18", 24", 30", 36" conveyers & belting
Smithco 30"x24', 7½ H.P. Belt Conveyor.
Barber Greene Model 848 Asphalt Plant.

SHOVELS AND CRANES

Lorain L-50J, 1-yd. Diesel Crane Hoe
Lorain L-50K, 1-yd. Diesel Shovel.
Lorain L-36, ⅜-yd. Diesel Bakhoe.
Lorain L-26K3, ¾-yd. Diesel Backhoe.
Lorain L-36, ¾-yd. diesel dragline. Excellent.
Link Belt LS71, ¾-yard Gas Clam-Crane.
Insley K-12, ½-yd. gas backhoe
Bucyrus-Erie 10B, ⅝-yd. Gas Shovel.
Byers 83-cc, 20-ton truck Crane
Lorain MC-414, 20-ton Moto-Crane.
Link Belt HC-90, 25-ton truck crane.
Michigan TLDT-20, 10-ton truck crane.
Lorain MC-254, 15-ton Moto-crane.
Lorain TL-20, 10-ton Moto-crane.

TRUCKS, TRACTORS, SCRAPERS

3—Euclid 13-yd. bottom dumps. Good.
2—Euclid 27FD, 15-ton rear dumps
1—Euclid 2FD, 15-ton rear dump.
1—Euclid tractor with 3200 gallon water tank
1—Caterpillar D-8 with push block
1—Caterpillar D-7 with cable bulldoser.
1—Caterpillar D-7 with Hydraulic Angledoser
1—Caterpillar D-6 with Hydraulic Angledoser
1—Caterpillar D-6 with cable angle doser.
1—Caterpillar HT-4, 1¼-yd. Traxcavator.
1—Caterpillar D-4 tractor only.
2—Euclid TC-12, twin engine tractors
1—International TD-24 with cable angledoser.
1—Letourneau Super C Tournadoser. Excellent.
3—Letourneau CR, 12-yd. Tournapulls.
1—Allis-Chalmers HD-15 with Cable Bulldoser.
1—Allis-Chalmers HD-9-G Tractor with loader.
4—International 2TT5, 15-yd. scrapers.
2—Allis Chalmers TS-360, 15-yd. scrapers.
2—Euclid TS-24, 24-yd. twin engine scrapers
1—Euclid 15½-yd. six wheel scraper.
3—Euclid 7-yd. overhung engine scrapers

Inquire for list of drilling equipment, air compressors, diesel power units, generators, shovel & backhoe attachments.

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Camp Hill, Pa.
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60"x48" to 6"x3"
New and used RELIABLE

"Farrel-Bacon" Jaw Crushers

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DRYERS & KILNS

10' x 11' x 175' Vulcan Kiln, 1⅜"
10' x 78' National dryers, ¾"
8'-8" x 70' Hardinge, ⅜" welded
8' x 60' Davenport, 7/16" welded
7'-6" x 62' kiln, ½" welded
7' x 70' Louisville, ½" welded
7' x 60' Bonnet dryer, ⅜"
7' x 50' Allis-Chalmers, ⅜"
6' x 7' x 100' kiln, ½" shell
6' x 52' Bonnet dryer, 5/16"
6' x 50' Louisville steam-tube
6' x 30' Davenport steam-tube
4'-9" x 32' dryers, ¾" shell
3' x 23' Standard dryer, ¼"

SPECIAL

Vulcan 10' x 11' x 175' long rotary kiln, 1⅜" shell, 2-tires, firing hood, etc.

MILLS

Kennedy 7' x 9' contin. ball
Hardinge 7' x 36" conical pebble
Hardinge 6' x 48" conical ball, 75 HP
Allis-Chalmers 6' x 18' pebble-tube
Allis-Chalmers 6' x 16' ball-tube
Allis-Chalmers 5' x 22' ball-tube
Allis-Chalmers 5' x 5' ball, 75 HP
Hardinge 4'-6" x 16" conical ball

CRUSHERS—PULVERIZERS

Farrel 36" x 15" jaw crushers
Buchanan 24" x 13" jaw, 50 HP
Farrel 20" x 6" jaw, 30 HP
Mitchell 18" x 9" jaw, 25 HP
Sturtevant 8" x 10" jaw
Babcock & Wilcox #32E ball type pulv., air-swept, 75 HP
Raymond 66" 6-roller mill, 200 HP
Raymond 50", 5-roller, hi-side mill
Dixie #5060 hammermill, 500 HP
Amer. #38-S rolling ring crusher
Wms. 36 x 24 hammermill, 50 HP
Robinson #13 sawtooth crusher, 15 HP
Pa. #C330 rever. hammermill, 60 HP

MISC.

Elevators, 50' high, steel buckets, rubber belt
Elevators, 95' high, steel buckets, chain, casing, 7½ HP drive
Conveyor, 24" x 538' troughing belt
Conveyor, 18" x 50' drag conveyor
Komarek-Greaves horiz. pug mixers, single & dbl. shaft.

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SPECIALS!!!

Buffalo type B 60 ton motor truck scales 45' x 12' platform, tape recorder and printer
Fuller-Kenyon Conveying system pump type H2-7
Fuller Kenyon Airslide cement conveying system
Fuller Kinyon Type V-200 Rotary Vacuum Pump
Fuller Kinyon Bulk Cement Type "D" Unloader with 1000' 8" pipe, 150 HP motor, two Fuller Compressors 7" type pump
Mixermobile Model M-7, tower 40', 2 yd Mixer
Howe scale No. 82 exact weight indicator

MILLS—CRUSHERS—KILNS—DRYERS

JAW: Reliance, 14x24, Buchanan 18x36, 30x42, Type C 30x42, Cedar Rapids 2036, Traylor 28x36, 36x48, 56x72, Lippman 24x36; Universal 30x42; Superior McCully 42x40.
GYRATORY: Al. Chal. 8, 5K, 10", 16, Gates 12K; Traylor T2 Kennedy Van Saun 37½.
CONE: Symons 3', 4¼', 5½', Kue-Ken 36"; Traylor TT4; Telsmith 2'.
ROLL: Cedar Rapids 24x16, 55x30; Al. Chal. 37x16, 42x16. Pioneer 40x22, 40x24 triple, 54x24; Telsmith 40x22; Universal 30x18; Lippman 40x20.
MILLS—ROD—Denver 4x8, 4x10; Hardinge 4x10; Marcy 3x8, 8x12.
TUBE: Al. Chal. 6x22, Smidth 5½x30, 6'9"x21; Hardinge 4½x16" 8x18"; 8x9'; 8x36; 8x48; 10x48.
HAMMERMILLS: Penn SXT-350 HP motor, 6XR 10'x4'7"; Stedman 24x30, 36x42; Cedar Rapids 50-50, 2033, 30x33, 30x42 double; Dixie 36x50.
AUTOCLAVES: J&C 6'8"x58" Quick Acting.
KILNS: 6'x50', 6'x120', 9'x100', 8x124'.
DRYERS: 6'x40, 6x60, 6x72.
BALL MILLS: 4½'x16", 8'x30", 8'x48"

CRUSHING PLANTS

Pioneer Port. 2436 jaw 4022 twin roll 36"x30' apron feeder. Murphy Diesel.
Universal 4024 roll port. Murphy Diesel. New 1958.
C-R 2236 jaw, Port. double deck grizzly. Diesel, heavy duty feeder.
Diamond Port. 2036 jaw. Heavy tandem. New condition.
C-R 2236 Port. 125 HP motor.

CONCRETE PLANTS AND EQUIPMENT

Johnson 150 ton 3 compt. aggr. cement 1500
Noble CA-104-100 4 compt. 300 CF cement silo
Johnson TY 100-200 yd bin 4 aggr. 1 cement.
Koehring mixer, 3 yd batcher.
Erie Strayer 120 tons aggr. bin, 880 bbls. cement
Noble CA-354 4 compt. large capacity. Complete
Erie-Strayer new 1955, 10 yds per hour.
Johnson TY-227 3 compt. 105 tons with 3 yd multiple batcher
B-K 100 bbls. HI-100 bbls. LO Cement Bins, and aggr. 3 compartment aggregate bin complete.

DREDGES

Morris 6" Diesel on 14'x36' hull
Ellicott 14" x 12" Steel Hull 64' x 32' Diesel.
10" Portable Diesel powered. Complete.
Amsco 12" suc. 10" Dis. Hull 24'x50' Diesel-Elec.
Ellicott 8" with cutter. Diesel Hull 48'x18'x3'6"
8" Hydraulic Diesel. On 32'x8' steel pontoons
6" portable Diesel complete with cutters, etc.

SCREENS

Tyler-Hummer 4'x10' one Deck
New Symons 3'x12' 5 HP Elec. Motor.
Simplicity 5'x14' double deck
Cedar Rapids 4'x12' dbl. deck 25 H.P. elec. motor
Pioneer 5'x12' 2 deck 20 H.P. elec. motor
C-R 4'x14' 2 deck 25 HP motor

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CO 7-0723 Cable: RICHWALSH

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No. 25½ Kennedy Van Saun gearless gyratory crusher. Serial No. 1535. Complete with 40 HP motor and starter. Excellent condition.

Bucyrus Erie 22 T Blast Hole Drill, crawler mounted with tools and spare parts. Good condition.

Hough Payloader, Model HF, ¾ yd. Hydraulic bucket. Fair condition.

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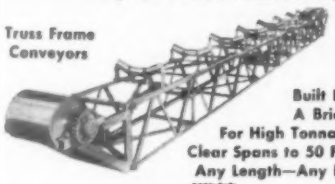
BONDED TROUGHING IDLER CONVEYOR BARGAINS

8" Jr. I Beam Frame Conveyors

Truss Frame Conveyors



Built Like A Bridge For High Tonnages Clear Spans to 50 Ft.— Any Length—Any Belt Width

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2 1/4" or 2 7/16" diameter shaft.

We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, 1/8" top rubber cover x 1/16" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN #1138.**

Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN #1189 AND PRICES.**

JR. I BEAM CONVEYOR PRICES

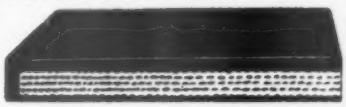
Conveyor Prices Include Belting

Belt Width	Conveyor Length	List Price	Sale Price	Add or Deduct Per Foot
14"	25'	$1425	$ 766	
14"	60'	2266	1181	$16.62
14"	85'	3445	1763	
16"	20'	1287	780	
16"	45'	2180	1128	
16"	60'	2715	1384	17.10
16"	90'	3786	1897	
16"	150'	5928	2923	
18"	25'	1507	830	
18"	45'	2261	1190	
18"	70'	3205	1641	
18"	85'	3771	1912	18.03
18"	100'	4337	2182	
18"	130'	5469	2723	
18"	200'	8111	3985	
20"	25'	1547	871	
20"	60'	2940	1546	
20"	75'	3536	1836	19.30
20"	90'	4133	2125	
24"	25'	1622	922	
24"	45'	2479	1335	
24"	70'	3550	1852	
24"	100'	4835	2473	20.68
24"	120'	5692	2886	
24"	150'	6977	3507	
24"	200'	9119	4540	
30"	50'	2969	1591	
30"	70'	3948	2054	
30"	90'	4928	2518	23.17
30"	140'	7376	3676	
36"	25'	1854	1105	
36"	45'	2915	1623	
36"	60'	3711	2012	25.91
36"	100'	5832	3048	

Other lengths and belt widths priced upon application. **BONDED 30" DEEP TRUSS CONVEYORS** also in heavy duty Portable Models. Available with Screen and Feeder and with mast or mastless type undercarriage and hydraulic powered mechanism. Lengths to 60 feet and belt widths through 30 inches. Equipped with Tow Hitch for easy moving from one job-site to another. **PRICED FROM $2365.**

TESTED CONVEYOR BELTING*

WE PAY FREIGHT ON 200 POUNDS OR OVER PLUS AN ADDITIONAL 10% SAVINGS FROM SALE PRICE FOR FULL ROLLS 500 TO 650 FEET.



MAJOR BRAND: 12# to 15# Friction Pull. 800# to 1000# Cover Tensile. Heavy Duty. 28 oz. duck. 1/8" top x 1/16" bottom rubber covers. Tough cotton duck, strong carcass and proper flexibility. Used in moving boxes, bags, coal, sand, gravel, crushed stone, salt, earth and similar materials.

Width	Ply	U. S. Made Per Foot
14"	4	$2.94
16"	4	3.09
18"	4	3.42
20"	4	3.95
24"	4	4.43
30"	4	5.42
36"	4	6.43

MAJOR C-BEE BRAND: Smooth Surface. 15# to 17# Friction Pull. 1600# to 2300# Cover Tensile. 28 oz. duck 4 Ply. Skim coat between plies. Heavy Duty belt for severe service and abrasion resistance.

Width	Top Cover	Bottom Cover	Imported Belt Per Foot
14"	1/8"	1/16"	$2.96
16"	1/8"	1/16"	3.12
18"	1/8"	1/16"	3.44
20"	1/8"	1/16"	3.97
24"	1/8"	1/16"	4.46
30"	1/8"	1/16"	5.56
36"	1/8"	1/16"	6.45
THE FOLLOWING BELTS ARE 5 PLY, 32 OZ. DUCK:			
24"	1/8"	1/16"	$4.53
30"	1/8"	1/16"	5.60
36"	1/8"	1/16"	7.18

MAJOR BEE BRAND: 16# to 19# Friction Pull. 2400# to 3000# Cover Tensile. Skim Coat Between Plies. A high grade of heavy duty, 28 oz. duck with 1/8" top x 1/16" bottom rubber covers. For severe service and abrasion resistance. For stone, mineral ores, concrete, cement and coal.

Width	Ply	U. S. Made Per Foot	Imported Belt Per Foot
16"	4	$3.60	$3.14
18"	4	3.98	3.47
20"	4	4.54	3.95
24"	4	5.14	4.58
30"	4	6.31	5.58
24"	5	5.10	4.73

*** All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.**

Other widths, plies, duck weights and cover thicknesses available at low prices.

WRITE FOR FREE SAMPLE & BULL. #1263

BONDED® FP SERIES PLATE FEEDERS

WRITE FOR BULLETIN #1211

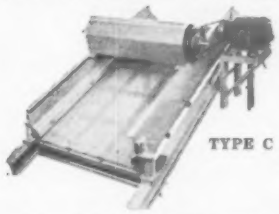
For use under bins. For controlling feed to picking tables and for regulating material flow to screens, crushers, grinders and conveyors. Can be operated from conveyor drive. Available with or without hoppers and stands.

Priced from **$455**

BONDED* VIBRATING SCREENS

PROMPT SHIPMENT OF ALL MODELS

SPECIAL SERVICE SCREENS



TYPE C

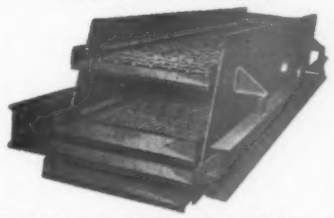
WRITE FOR BULLETIN #1224

For scalping middle-range pieces and accurate sizing of fines where quantity and feed do not warrant a larger capacity, heavy duty model. Medium to heavy construction. Can also be suspended from four steel cables and springs for portable or temporary installation. Vibration remains in working screen body. No shaking of tipple, building or platform.

Priced from **$487**

WRITE FOR "SEVEN SECRETS OF SUCCESSFUL SCREENING" IN BULL. 1056

HEAVY DUTY SCREENS

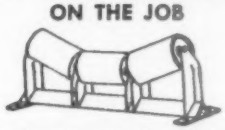


FACTORY BALANCED, CONTROLLED VIBRATION. Four bearing positive throw eccentric shaft; 3' x 6' to 5' x 14'. 1 to 5 decks. **"9 REASONS WHY BONDED IS YOUR BEST BUY."**

For high tonnages, heavy scalping and multiple sizing of such minerals and industrial products as handled by above models. No dead spots. Springless live-rubber mounting of screen body controls vibration. Screen cloth and plate in all models reversible for longer life. Their finished edges prevent plates from splitting and cloth from ravelling.

Priced from **$1620**

BONDED® IDLERS & RETURN ROLLS FOR UTMOST ECONOMY ON THE JOB



3-roll, 5" diameter Troughing Idlers for:			
14" belt	$19.75	24" belt	$22.75
16" belt	20.50	30" belt	23.85
18" belt	21.99	36" belt	24.90
20" belt	22.10	48" belt	27.50
1-roll, 5" diameter Return Rolls for:			
14" belt	$ 8.50	24" belt	$11.00
16" belt	9.00	30" belt	12.50
18" belt	9.50	36" belt	13.75
20" belt	10.00	48" belt	16.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable prelubricated sealed ball bearings. Maintenance is negligible. **WRITE FOR BULLETIN #1138.**

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WHERE TO BUY

continued . . .

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ROTARY KILNS, DRYERS, COOLERS

1—Smidth 8'6" x 175' Rotary Kiln 3/4" shell.
1—Allis Chalmers 9' x 130' Rotary Kiln 3/4" shell.
2—Allis Chalmers 7'6" x 7' x 125' Rotary Kilns.
1—Allis Chalmers 4' x 40' Rotary Kiln 5/8" shell.
1—Traylor 8' x 80' Rotary Dryer 5/8" shell.
1—Vulcan 8' x 80' Rotary Dryer 1/2" shell.
2—RotoLouvre Dryers 6'4" x 24'.
1—Vulcan 6'5" x 60' Rotary Dryer 5/8" shell.
1—Vulcan 6' x 54' Rotary Dryer 5/8" shell.
1—Rennonburg 6' x 50' Rotary Dryer 5/8" shell.
2—Bonnot 6' x 40' Rotary Dryers 1/2" shell.
3—Davis 6' x 25' Rotary Dryers 1/2" shell.
1—Ruggles Cole 5' x 30' Rotary Dryer 5/8" shell.
1—Allis Chalmers 4' x 30' Rotary Dryer 5/8" shell.
1—3' x 36' Rotary Dryer 3/8" shell.
1—34" x 30' Rotary Dryer 1/2" shell.

MILLS - CRUSHERS - PULVERIZERS

1—Traylor 42" Gyratory Crusher 250 HP motor.
1—Traylor Compeb Mill, 7' x 27', 600 H.P.
2—Hardinge 10' x 48", 8' x 36" Conical Ball Mills, motor driven.
1—Traylor 54" x 24" double roll crusher.
1—Traylor 42" x 18" double roll crusher.
1—Allis Chalmers 36" x 16" double roll crusher.
4—Strategic 30" x 16" double roll crushers.
3—Traylor 30" x 14" double roll crushers.
1—Penn Hammermill, size 5060, Hopper opening 60" x 24".
1—Penn. Super-Thor Hammermill, size SXT-13, 250 H.P.
1—Kennedy Van Saun 4'6" x 9' Ball Mill.

AIR SEPARATORS - SCREENS

1—16' dia. Raymond Whizzer separator with 50 H.P. motor.
1—14' dia. Raymond Whizzer separator with 60 H.P. motor.
1—14' dia. Gayco Whizzer separator with 25 H.P. motor.
1—8' Gayco Whizzer separator with 10 H.P. motor.
1—6' x 14' Link Belt double deck Vibrating Screen.
1—5' x 12' Niagara double deck Vibrating Screen.

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DIESEL ELEC. LOCOMOTIVES & CRANES
4—65 ton Whitcomb 2—25 ton & 2—20 Ton
2—45 ton & 1—80 ton & 4—100 ton Gen. Elec.
25 ton Amer. Diesel Loco Crane

ROTARY DRYERS & KILNS
5' x 25', 6' x 72', 8' x 60', 9' x 160', 10' x 78', 5' x 35' Ruggles-Coles XA-8 Dbl. Shell.
36" x 30' Ruggles Coles Rotary Kiln complete

REDUCTION MILLS & FEEDERS
6' x 9' Traylor Ball Mill w/motor
5' x 5' & 6' x 4' CIW Ball Mill w/motor
5' x 10', 6' x 12" & 7' x 15' Rod Mills
2—KVS 5' x 8' Ball Tube Mills Air Swept
4' 0" Traylor Type TY-Gyratory
848 Allis-Chalmers Hydrocone Crusher
18" x 30", 24" x 36", 36" x 42" Jaw Crushers.
36" KVS Primary Breaker
25B Telsmith Primary Breaker
2—20" Allis-Chalmers S.McC. Gyratory Crs.
15" x 24" Rogers RB Jaw Crusher
18" x 36" Farrel Bacon Jaw Crusher
15" x 24" & 20" x 36" Pioneer Jaw Crushers
2A Cedar Rapids Port. 24 x 16 Roll Crusher
14x28, 15x24 & 10x36 Cedar Rapids Jaw
48" x 72" Buchanan C Jaw Crusher
Bradley Hercules Mills (3) Type 6000
F5S Syntron Grizzley Feeder
3' x 12' Seco Single Screen
8' Gayco Centrifugal Air Separator
36" x 96" H.R. Vibrating Pan Feeder New
24" x 95' H.R. Truss Conveyor New
6—30" x 32" Dings Magnetic Head Pulleys
3—200 HP & 160 HPSD. Ottumwa Elec. Hoists.

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2 Amer. R20-60 Ganty 139' Boom

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CRUSHERS, JAW: One 40 x 42" Allis Chalmers with 150 H.P., V-belt drive motor and controls, with or without heavy duty Apron Feeder 42" x 14'3" with motor, reducer, and drive, condition guaranteed. One Allis Chalmers 24 x 36" and one 18 x 30". One Traylor 15 x 24". Other crushers 8 x 10" to 48 x 60".

CRUSHERS, GYRATORY: 48" Primary and 20" Secondary, with motors and drive. One Telsmith 16-B.

CRUSHER, ROLL: Traylor 16 x 36".

CONCRETE MIXER: One 84 cu. ft., air operated, tilting type.

DRYERS: One 5' dia. x 25 ft. and one 3' dia. x 34 ft.

KILN: Rotary, 4½ ft. dia. x 40 ft., with rotoclone and 7½ H.P. motor, 3 H.P. motor and speed reducer, classifier, kiln burner, etc.

DOUBLE DRUM HOISTS: One 53" x 36" double clutched drums, 75 H.P. or 200 H.P. One 72" dia., 40" face, both drums clutched, 1¼" rope, 880 FPM, 500 H.P. One Nordberg double clutched drums, 10' dia., 10' face, 1½" rope, 1250 H.P., 1200 FPM.

SINGLE DRUM HOIST: One 84" dia., 64" face, 1⅝" rope, 150 H.P. Two 86" dia. roller bearing Sheaves.
All the above hoists with post brakes, Lilly controls, 2200 volt motors. Other hoists 100 to 1500 H.P. for shaft or slope.

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1—10' x 48" Hardinge mill.
1—8' x 36" Hardinge mill.
2—16' Sturtevant air separators.
1—6' x 50' dryer.
1—#1 Raymond mill.
1—3 to 4 T.P.H. continuous type lime hydrator.

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Pettibone-Mulliken Casting
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